Division 13

Maintenance/Bridge Maintenance Assembly Office

Bid Set

10/18/16

NC Department of Transportation, Mitchell County SCO # 141126301A

October 18, 2016

Building Code Summary: Office Building

2012 NC State Building Code - 2009 IBC with NC Amendments

Name of Project: Maintenance/Bridge Maintenance Assembly Office
Address: 928 Greenwood Road, Spruce Pine, NC 28777

Proposed Use: Office/Assembly
Owner/Authorized Agent: Sterling Baker
Owned By: State of North Carolina ☐ City/County ☐ Private ■ State
Code Enforcement Jurisdiction: ☐ City _____ ☐ County Mitchell ■ State

Phone: 919-707-4552
Email: sbaker@ncdot.gov

LEAD DESIGN PROFESSIONAL: Archtectural Design Studio, Mike Cox

DESIGNER	FIRM/NAME	LICENSE #	TELEPHONE	EMAIL
Architectural:	ADS, Mike Cox, FAIA	50382 & 2653	(828)252-0355	mike@ads-architects.com
Civil:	McKim & Creed, Rick Cooper, PE	F-1222 & 16277	(828)252-8181	RCooper@mckimcreed.com
Electrical:	McKim & Creed, Thomas Bufford, PE	F-1222 & 030422	(828)252-8181	TBufford@mckimcreed.com
Fire Alarm:	N/A			
Plumbing:	McKim & Creed, Rick Cooper, PE	F-1222 & 16277	(828)252-8181	RCooper@mckimcreed.com
Mechanical:	McKim & Creed, Rick Cooper, PE	F-1222 & 16277	(828)252-8181	RCooper@mckimcreed.com
Sprinkler/Standpipe:	N/A			
Structural:	SKA, Inc., Paul Fama, PE	F-0508 & 037393	(828)274-4440	dpf@suttonkennerly.com
Retaining Walls > 5' High:	N/A			
Other:				

2012 EDITION OF CODE FOR: ■ New Construction ☐ Addition ☐ Upfit
EXISTING: ☐ Reconstruction ☐ Alteration ☐ Repair
CONSTRUCTED: (date) _____ ORIGINAL USE (s): (Ch. 3): _____
RENOVATED: (date) _____ CURRENT USE(s) (Ch. 3): _____
PROPOSED USE(s) (Ch. 3): B Office

BASIC BUILDING DATA
Construction Type: ☐ 1-A ☐ II-A ☐ III-A ☐ IV ☐ V-A
(check all that apply) ☐ 1-B ☐ II-B ☐ III-B ■ V-B
Mixed Construction: ■ No ☐ Yes Types: _____
Sprinklers: ■ No ☐ Partial ☐ Yes ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D
Standpipes: ■ No ☐ Yes Class ☐ I ☐ II ☐ III ☐ Wet ☐ Dry
Fire District: ■ No ☐ Yes Flood Hazard Area: ■ No ☐ Yes
Building Height: Feet 17'-4" Number of Stories 1
Mezzanine: ■ No ☐ Yes

Gross Building Area:

FLOOR	EXISTING (SQ. FT.)	NEW (SQ. FT.)	SUB-TOTAL (SQ. FT.)
TOTAL	0 SF	2,849 SF	2,849 SF

ALLOWABLE AREA

Occupancy:

Assembly ☐ A-1 ☐ A-2 ■ A-3 ☐ A-4 ☐ A-5
Business ■
Educational ☐
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4
I-3 Use Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Mercantile ☐
Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
Storage ☐ S-1 Moderate ☐ S-2 Low ☐ High Piled
☐ Parking Garage ☐ Open ☐ Closed ☐ Repair Garage
Utility & Miscellaneous ☐

Accessory Occupancy:

Assembly ☐ A-1 ☐ A-2 ☐ A-3 ☐ A-4 ☐ A-5
Business ☐
Educational ☐
Factory ☐ F-1 Moderate ☐ F-2 Low
Hazardous ☐ H-1 Detonate ☐ H-2 Deflagrate ☐ H-3 Combust ☐ H-4 Health ☐ H-5 HPM
Institutional ☐ I-1 ☐ I-2 ☐ I-3 ☐ I-4
I-3 Use Condition ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
Mercantile ☐
Residential ☐ R-1 ☐ R-2 ☐ R-3 ☐ R-4
Storage ■ S-1 Moderate ☐ S-2 Low ☐ High Piled
☐ Parking Garage ☐ Open ☐ Closed ☐ Repair Garage
Utility & Miscellaneous ☐

Incidental Uses (Table 508.2.5)**: N/A**

☐ Furnace room where any piece of equipment is over 400,000 Btu per hour input
☐ Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower
☐ Refrigerant machine room
☐ Hydrogen cutoff rooms, not classified as Group H
☐ Incinerator Rooms
☐ Paint shops, not classified as Group H, located in occupancies other than Group F
☐ Laboratories and vocational shops, not classified as Group H. located in a Group E or I-2 Occupancy
☐ Laundry rooms over 100 square feet
☐ Group I-3 cells equipped with padded surfaces
☐ Group I-2 waste and linen collection rooms
☐ Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons...
☐ Rooms containing fire pumps
☐ Group I-2 storage rooms over 100 square feet
☐ Group I-2 commercial kitchens
☐ Group I-2 laundries equial to or less than 100 square feet
☐ Group I-2 rooms or spaces that contain fuel-fired heating equipment

Special Uses: ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 410 ☐ 411 ☐ 412 ☐ 413 ☐ 414 ☐ 415 ☐ 416 ☐ 417 ☐ 418 ☐ 419 ☐ 420 ☐ 421 ☐ 422 ☐ 423 ☐ 424 ☐ 425 ☐ 426 ☐ 427

Special Provisions: ☐ 509.2 ☐ 509.3 ☐ 509.4 ☐ 509.5 ☐ 509.6 ☐ 509.7 ☐ 509.8 ☐ 509.9

Mixed Occupancy: ☐ No ■ Yes Separation: 0 Hr. Exception: 508.3

☐ Incidental Use Separation (508.2.5)
This separation is not exempt as Non-Separated Use (See Exceptions)

■ Non-Separated Use (508.3)
The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.

☐ Separated Use (508.4) - See below for area calculations
For each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

ALLOWABLE AREA

Story No.	Description And Use	(A) Bldg. Area Per Story (Actual)	(B) Table 503[3] Area	(C) Area For Frontage Increase [1]	(D) Area For Sprinkler Increase [2]	(E) Allowable Area Or Unlimited [3]	(F) Maximum Building Area[4]
First Floor	Office/A-3 Assembly	2,849 SF	6,000 SF	N/A	N/A	19,000 SF	19,000 SF
Total		2,849 SF	6,000 SF	N/A	N/A	19,000 SF	19,000 SF

[1] Frontage area increases from Section 506.2 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = _____(F)
b. Total Building Perimeter = _____ (P)
c. Ratio (F/P) = _____ (F/P)
d. W = Minimum width of public way = _____(W)
e. Percent of frontage increase $I_f = 100\ [\ F/P - 0.25\ ]\ x\ W/30\ =$ ____(%)

[2] The sprinkler increase per Section 506.3 is as follows: N/A
a. Multi-story building I_s = 200 percent
b. Single story building I_s= 300 percent

[3] Unlimited area applicable under conditions of Section (507).

[4] Maximum Building Area = total number of stories in the building x E (506.4).

[5] The maximum area of open parking garages must comply with Table 406.3.5. The maximum area of air traffic control towers must comply with 412.1.2.

ALLOWABLE HEIGHT

	Allowable (Table 503)	Increase for Sprinklers	Shown on Plans	Code Reference
Type of Construction	Type V-B		Type V-B	T503
Building Height in Feet	Feet 40'	N/A	Feet 17'-4"	T503
Building Height in Stories	Stories 1	Stories + 1 = N/A	Stories 1	T503

FIRE PROTECTION REQUIREMENTS

Building Element	Fire Separation Distance (Feet)	Rating Req'd.	Rating Provided (W/ _____ • Reduction)	Detail # and Sheet #	Design # for Rated Assembly	Design # for Rated Penetration	Design # for Rated Joints
Structural Frame, including columns, girders, trusses		N/A					
Bearing Walls							
Exterior							
North	> 30'	0	0				
East	> 30'	0	0				
West	> 30'	0	0				
South	> 30'	0	0				
Interior		0	0				
Nonbearing Walls and Partitions Exterior walls							
North		N/A					
East		N/A					
West		N/A					
South		N/A					
Interior Walls & Partitions		0	0				
Floor Construction including supporting beams and joists		N/A					
Roof Construction including supporting beams and joists		0	0				
Shaft Enclosures - Exit		N/A.					
Shaft Enclosures - Other		N/A					
Corridor Separation		0 (a)	0				
Occupancy Separation		N/A					
Party/Fire Wall Separation		N/A					
Smoke Barrier Separation		N/A					
Tenant/Dwelling Unit Separation		N/A					
Incidental Use Separation		1 (b)	1 (b)	T0.3	U419		

* Indicate section number permitting reduction.
a) One exit permitted from office area; occupant load for this portion of the building is less than Table 1015.1 value. Per 1018.1, exception 4, rated corridor is not required in an occupancy in Group B which is a space requiring only a single means of egress.
b) One hour required at Mechanical Room 113 per Table 508.2.5.

LIFE SAFETY SYSTEMS REQUIREMENTS

Emergency Lighting: ☐ No ■ Yes
Exit Signs: ☐ No ■ Yes
Fire Alarm: ■ No ☐ Yes
Smoke Detection Systems: ■ No ☐ Yes ☐ Partial _____
Panic Hardware: ■ No ☐ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: FLOOR PLAN 2/SP-1 & SITE PLAN 1/SP-2

☐ Fire and/or smoke rated wall locations (Chapter 7)
■ Assumed and real property line locations
☐ Exterior wall opening area with respect to distance to assumed property lines (705.8)
☐ Existing structures within 30' of the proposed building
■ Occupancy types for each area as it relates to occupant load calculation (Table 1004.1.1)
■ Occupant loads for each area
■ Exit Access travel distances (1016)
☐ Common path of travel distances (1014.3 & 1028.8)
☐ Dead end lengths (1018.4)
■ Clear exit widths for each exit door
■ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.1)
■ Actual Occupant load for each exit door
☐ Schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
☐ Location of doors with panic hardware (1008.1.10)
☐ Location of doors with delayed egress locks and the amount of delay (1008.1.9.7)
☐ Location of doors with electromagnetic egress locks (1008.1.9.8)
☐ Location of doors equipped with hold-open devices
☐ Location of emergency escape windows (1029)
☐ The square footage of each fire area (902)
☐ The square footage of each smoke compartment (407.4)
☐ Note any code exceptions or table notes that may have been utilized regarding the items above

Index to Drawings

ALTERNATES

1. ALTERNATE NO. 1 - CONCRETE STEPS AND RAILS
2. ALTERNATE NO. 2 - FENCE AND GATES
3. ALTERNATE NO. 3- FIREMAN LOCK BOX - KNOX BOX

EXIT REQUIREMENTS
NUMBER AND ARRANGEMENT OF EXITS

Floor, Room or Space Designation	Minimum[2] Number of Exits		Travel Distance		Arrangement Means of Egress[1,3] (Section 1015.2)	
	Required	Shown on Plans	Allowable Travel Distance (Table 1016.1)	Actual Travel Distance Shown on Plans	Req'd Distance Between Exit Doors	Actual Distance Shown on Plans
First Floor (a)	2	4	200'	66' MAX.	43'	74'

[1] Corridor dead ends (Section 1017.3)
[2] Buildings with single exits (Table 1019.2), Spaces with one means of egress (Table 1015.1)
[3] Common Path of Travel (Section 1014.3)
a) One exit permitted from office area; one exit permitted from assembly area; occupant loads for each of these portions of the building is less than Table 1015.1 value.

EXIT WIDTH

Use Group or Space Description	(a) Area[1] sq. ft.	(b) Area[1] Per Occupant (Table 1004.1.1)	Calculated Occupant Load (a-b)	(c) Egress Width Per Occupant (Table 1005.1) Stair	(c) Egress Width Per Occupant (Table 1005.1) Level	Exit Width (in)[2,3,4,5,6] Required Width (Section 1005.1) (a-b) x c Stair	Exit Width (in)[2,3,4,5,6] Required Width (Section 1005.1) (a-b) x c Level	Exit Width (in)[2,3,4,5,6] Actual Width Shown on Plans Stair	Exit Width (in)[2,3,4,5,6] Actual Width Shown on Plans Level
Office Area	1692 SF	100 gross	18	N/A	0.2	N/A	3.6"		32"
Assembly	613 SF	15 net	41	N/A	0.2	N/A	8.2"		32"
Storage, Mechanical, Electrical	271 SF	300 gross	3				0.6"		80"
TOTAL			62 Occupants		0.2		12.4"		144"

[1] See Table 1004.1.1 to determine whether net or gross area is applicable. See definition "Area, Gross" and "Area, Net" (Section 1002)
[2] Minimum stairway width (Section 1009.1); min. corridor width (Section 1017.2); min. door width (Section 1008.1)
[3] Minimum width of exit passageway (Section 1023.2)
[4] See Section 1004.5 for converging exits.
[5] The loss of one means of egress shall not reduce the available capacity to less than 50 percent of the total required (Section 1005.1)
[6] Assembly occupancies (Section 1025)

ACCESSIBLE PARKING

Lot or Parking Area	Total # of Parking Spaces Required	Total # of Parking Spaces Provided	# of Accessible Spaces Provided Regular With 5' Access Aisle	# of Accessible Spaces Provided Van Spaces with 8' Access Aisle	Total # Accessible Provided
Parking Lot	N/A	21	0	2	2

STRUCTURAL DESIGN

DESIGN LOADS:
Importance Factors: Wind (I_W) 1.0; Snow (I_S) 1.0; Seismic (I_E) 1.0
Live Loads: Roof 20 psf; Mezzanine N/A psf; Floor N/A psf - Existing
Ground Snow Load: 20 psf
Wind Load: Basic Wind Speed 90 mph (ASCE-7); Exposure Category C; Wind Base Shears (for MWFRS) V_X= 5 kips V_Y= 8 kips
SEISMIC DESIGN CATEGORY ☐ A ☐ B ■ C ☐ D
Provide the following Seismic Design Parameters:
Occupancy Category (Table 1604.5) ☐ I ■ II ☐ III IV
Spectral Response Acceleration S_S 0.293 %g S_1 0.104 %
Site Classification D ☐ Field Test ☐ Presumptive ☐ Historical Data
Basic structural system (check one)
■ Bearing Wall ☐ Dual w/ Special Moment Frame
☐ Building Frame ☐ Dual w/ Intermediate R/C or Special Steel
☐ Moment Frame ☐ Inverted Pendulum
Seismic base shear V_X = 18 kips V_Y = 18 kips
Analysis Procedure ☐ Simplified ☐ Equivalent Lateral Force ☐ Modal
Architectural, Mechanical, Components anchored? No
LATERAL DESIGN CONTROL: ■ Earthquake ☐ Wind
SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) 3000 psf
Presumptive Bearing capacity _____ psf
Pile size, type, and capacity _____

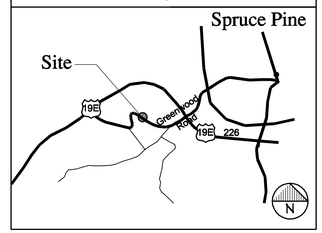
PLUMBING FIXTURE REQUIREMENTS

Use		Watercloset M	Watercloset F	Watercloset Unisex	Urinals	Lavatories M	Lavatories F	Lavatories Uni	Showers/Tubs M	Showers/Tubs F	Showers/Tubs Unisex	Drinking Fountains Regular	Drinking Fountains Accessible
Office/Assembly (a)	Provided	2	1	0	2	3	1	0				1	1
	Required	1	1	0	0	1	1	0				1	1

(a) Fixture count for entire building based on Office requirements - most strenuous.

SPECIAL APPROVALS
Special approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, ICC, etc., describe below)
State Construction Office

Location Map



ENERGY SUMMARY:

ENERGY REQUIREMENTS:

The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designersshall furnish the required portions of the project information for the plan data sheet. If energy cost budget method, state the annual energy cost budget vs. allowable energy cost budget.

Climate Zone: ☐ 3 ☐ 4A ■ 5A
Method of Compliance: ■ Prescriptive (Energy Code) ☐ Performance (Energy Code) ☐ Prescriptive (ASHRAE 90.1) ☐ Performance (ASHRAE 90.1 2007 for LEED-NC 2009 Compliance)

THERMAL ENVELOPE:

Roof/ceiling Assembly:
Description of assembly: Standing seam metal roof over 6" rigid insulation, 3/4" wood sheathing, wood trusses.
U-Value of total assembly: 0.033
R-Value of Insulation: 30
Skylights in each assembly: U-Value of skylight: N/A

Exterior Walls
Description of assembly: 8" CMU, 2" rigid insulation, air space, brick veneer
U-Value of total assembly: 0.074
R-Value of Insulation: 12.5 ci
Openings: (windows or doors with glazing):
U-Value of assembly: 0.33
Solar Heat Gain Coefficient: 0.33
projection factor: 0.25<x<0.5
Door R-Values: 2.0

Exterior Walls
Description of assembly: Wood gable trusses w/ R-13 batt insulation, gypsum sheathing, 2" rigid insulation, metal wall panels
U-Value of total assembly: 0.047
R-Value of Insulation: R-13 + R-10 ci
Openings: (windows or doors with glazing): Translucent Panels (Alternate 1)
U-Value of assembly: 0.33
Solar Heat Gain Coefficient: 0.33
projection factor: 0.25<x<0.5
Door R-Values: 2.0

Walls adjacent to unconditioned space: N/A
Walls below grade (each assembly): N/A
Floors over unconditioned space (each assembly): N/A
Floors slab on grade:
Description of assembly: 4" concrete slab over vapor barrier, 6" stone base
U-Value of total assembly: 0.067
R-Value of Insulation: 15
Horizontal/vertical requirement: 24 inches
Slab heated: No

MECHANICAL SUMMARY **SEE MECH. DWGS**

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT
Thermal Zone: ☐ 3 ☐ 4A ■ 5A
winter dry bulb:
summer dry bulb:
Interior design conditions
winter dry bulb:
summer dry bulb:
relative humidity:
Building heating load:
Building cooling load:
Mechanical Spacing Conditioning System:
Unitary
description of unit:
heating efficiency:
cooling efficiency:
heat output of unit:
cooling output of unit:
Boiler - total boiler output. If oversized, state reason.
Chiller - total chiller capacity. If oversized, state reason.
List equipment efficiencies:
Equipment schedules with motors (mechanical systems)
motor horsepower:
number of phases:
minimum efficiency:
motor type:
# of poles:

ELECTRICAL SUMMARY **SEE ELEC. DWGS**

ELECTRICAL SYSTEM AND EQUIPMENT
Method of Compliance:
Energy Code: ☐ Prescriptive ☐ Performance
ASHRAE 90.1: ☐ Prescriptive ☐ Performance
Lighting schedule
lamp type required in fixture:
number of lamps in fixture:
ballast type used in the fixture:
number of ballasts in fixture:
total wattage per fixture:
total interior wattage specified vs allowed:
total exterior wattage specified vs allowed:

Additional Prescriptive Compliance
☐ 506.2.1 More Efficient Mechanical Equipment
☐ 506.2.2 Reduced Lighting Power Density
☐ 506.2.3 Energy Recovery Ventilation System
☐ 506.2.4 Higher Efficiency Service Water Heating
☐ 506.2.5 On-site Supply of Renewable Energy
☐ 506.2.6 Automatic Daylighting Control System

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

T-1

Building Code Summary: Storage Building

2012 NC State Building Code - 2009 IBC with NC Amendments

Name of Project: Maintenance/Bridge Maintenance Assembly Office
Address: 420 Greenwood Road, Spruce Pine, NC 28777

Proposed Use: Office/Assembly
Owner/Authorized Agent: Priscilla Williams — Phone: 919-707-4552
Owned By: State of North Carolina ☐ City/County ☐ Private ■ State — Email: ptwilliams1@ncdot.gov
Code Enforcement Jurisdiction: ☐ City _____ ☐ County Mitchell ■ State

LEAD DESIGN PROFESSIONAL: Archtectural Design Studio, Mike Cox

DESIGNER	FIRM/NAME	LICENSE #	TELEPHONE	EMAIL
Architectural:	ADS, Mike Cox, FAIA	50382 & 2653	(828)252-0355	mike@ads-architects.com
Civil:	McKim & Creed, Rick Cooper, PE	F-1222 & 16277	(828)252-8181	RCooper@mckimcreed.com
Electrical:	McKim & Creed, Dale Reynolds, PE	F-1222 & 26643	(828)252-8181	DRenolds@mckimcreed.com
Fire Alarm:	N/A			
Plumbing:	McKim & Creed, Rick Cooper, PE	F-1222 & 16277	(828)252-8181	RCooper@mckimcreed.com
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Sprinkler/Standpipe:	N/A			
Structural:	SKA, Inc., Paul Fama, PE	F-0508 & 037393	(828)274-4440	dpf@suttonkennerly.com
Retaining Walls > 5' High:	N/A			
Other:				

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EXISTING: ☐ Reconstruction ☐ Alteration ☐ Repair
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RENOVATED: (date) _____ CURRENT USE(s) (Ch. 3): _____
PROPOSED USE(s) (Ch. 3): S-1 Storage

BASIC BUILDING DATA
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(check all that apply) ☐ 1-B ☐ II-B ■ III-B ☐ V-B
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Fire District: ■ No ☐ Yes Flood Hazard Area: ■ No ☐ Yes
Building Height: Feet 21'-6" Number of Stories 1
Mezzanine: ■ No ☐ Yes

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Utility & Miscellaneous ☐

Accessory Occupancy: N/A

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☐ Refrigerant machine room
☐ Hydrogen cutoff rooms, not classified as Group H
☐ Incinerator Rooms
☐ Paint shops, not classified as Group H, located in occupancies other than Group F
☐ Laboratories and vocational shops, not classified as Group H. located in a Group E or I-2 Occupancy
☐ Laundry rooms over 100 square feet
☐ Group I-3 cells equipped with padded surfaces
☐ Group I-2 waste and linen collection rooms
☐ Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons...
☐ Rooms containing fire pumps
☐ Group I-2 storage rooms over 100 square feet
☐ Group I-2 commercial kitchens
☐ Group I-2 laundries equial to or less than 100 square feet
☐ Group I-2 rooms or spaces that contain fuel-fired heating equipment

Special Uses: ☐ 402 ☐ 403 ☐ 404 ☐ 405 ☐ 406 ☐ 407 ☐ 408 ☐ 409 ☐ 410 ☐ 411 ☐ 412 ☐ 413 ☐ 414 ☐ 415 ☐ 416 ☐ 417 ☐ 418 ☐ 419 ☐ 420 ☐ 421 ☐ 422 ☐ 423 ☐ 424 ☐ 425 ☐ 426 ☐ 427

Special Provisions: ☐ 509.2 ☐ 509.3 ☐ 509.4 ☐ 509.5 ☐ 509.6 ☐ 509.7 ☐ 509.8 ☐ 509.9

Mixed Occupancy: ■ No ☐ Yes Separation: _____ Hr. Exception: _____

☐ Incidental Use Separation (508.2.5)
This separation is not exempt as Non-Separated Use (See Exceptions)

☐ Non-Separated Use (508.3)
The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.

☐ Separated Use (508.4) - See below for area calculations
For each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

ALLOWABLE AREA

Story No.	Description And Use	(A) Bldg. Area Per Story (Actual)	(B) Table 503[5] Area	(C) Area For Frontage Increase [1]	(D) Area For Sprinkler Increase [2]	(E) Allowable Area Or Unlimited [3]	(F) Maximum Building Area [4]
New Storage Bldg	S-1 Storage	1,581 SF	17,500 SF	N/A	N/A	9,000 SF	9,000 SF
Exist. Shed	S-1 Storage	2,807 SF	17,500 SF	N/A	N/A	9,000 SF	9,000 SF
Exist Garage	S-1 Storage	1,306 SF	17,500 SF	N/A	N/A	9,000 SF	9,000 SF
Total (a)		5,694 SF	17,500 SF	N/A	N/A	9,000 SF	9,000 SF

[a] New storage shed plus existing adjacent buildings are being considered as portions of ONE building per 705.3, exception. Each building is S-1 occupancy, Type V-B construction, total allowable area 9,000 SF. Aggregate area of the three buildings is less than 9.000 SF.

[1] Frontage area increases from Section 506.2 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = _____(F)
b. Total Building Perimeter = _____ (P)
c. Ratio (F/P) = _____ (F/P)
d. W = Minimum width of public way = _____(W)
e. Percent of frontage increase $I_f = 100\ [\ F/P - 0.25\ ]\ x\ W/30\ =$ ____(%)

[2] The sprinkler increase per Section 506.3 is as follows: N/A
a. Multi-story building $I_s = 200$ percent
[3] b. Single story building $I_s = 300$ percent
[4] Unlimited area applicable under conditions of Section (507).
[5] Maximum Building Area = total number of stories in the building x E (506.4).
The maximum area of open parking garages must comply with Table 406.3.5. The maximum area of air traffic control towers must comply with 412.1.2.

ALLOWABLE HEIGHT

	Allowable (Table 503)	Increase for Sprinklers	Shown on Plans	Code Reference
Type of Construction	Type V-B		Type V-B	T503
Building Height in Feet	Feet 55'	N/A	Feet 21'-6"	T503
Building Height in Stories	Stories 2	Stories + 1 = N/A	Stories 1	T503

FIRE PROTECTION REQUIREMENTS

Building Element	Fire Separation Distance (Feet) (a)	Rating Req'd.	Rating Provided (W/ _____* Reduction)	Detail # and Sheet #	Design # for Rated Assembly	Design # for Rated Penetration	Design # for Rated Joints
Structural Frame, including columns, girders, trusses		N/A					
Bearing Walls							
Exterior							
North	> 30' (a)	0	0				
East	12' (a)	0	0				
West	> 30' (a)	0	0				
South	11' (a)	0	0				
Interior		N/A					
Nonbearing Walls and Partitions Exterior walls		N/A					
North		N/A					
East		N/A					
West		N/A					
South		N/A					
Interior Walls & Partitions		N/A					
Floor Construction including supporting beams and joists		N/A					
Roof Construction including supporting beams and joists		0	0				
Shaft Enclosures - Exit		N/A					
Shaft Enclosures - Other		N/A					
Corridor Separation		N/A					
Occupancy Separation		N/A					
Party/Fire Wall Separation		N/A					
Smoke Barrier Separation		N/A					
Tenant/Dwelling Unit Separation		N/A					
Incidental Use Separation		N/A					

* Indicate section number permitting reduction.
a) For the purposes of fire separation distance and opening protections, the new storage building and the adjacent shed and garage are considered as portions of ONE building, per 705.3, exception. All three buildings are S-1 occupancy, Type V-B construction. The aggregate area of all three is less than the allowable Table 503 value.
For the purposes of fire separation and opening protections, this building and the adjacent S-1 occupancies to north and south are being considered as portions of ONE building per 705.3, exception. See 1/SP-2 and fire protection requirements table.

LIFE SAFETY SYSTEMS REQUIREMENTS

Emergency Lighting: ☐ No ■ Yes
Exit Signs: ■ No ☐ Yes
Fire Alarm: ■ No ☐ Yes
Smoke Detection Systems: ■ No ☐ Yes ☐ Partial _____
Panic Hardware: ■ No ☐ Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: SP-2

■ Fire and/or smoke rated wall locations (Chapter 7)
■ Assumed and real property line locations
■ Exterior wall opening area with respect to distance to assumed property lines (705.8)
☐ Existing structures within 30' of the proposed building
■ Occupancy types for each area as it relates to occupant load calculation (Table 1004.1.1)
■ Occupant loads for each area
■ Exit Access travel distances (1016)
☐ Common path of travel distances (1014.3 & 1028.8)
☐ Dead end lengths (1018.4)
■ Clear exit widths for each exit door
■ Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.1)
■ Actual Occupant load for each exit door
☐ Schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
☐ Location of doors with panic hardware (1008.1.10)
☐ Location of doors with delayed egress locks and the amount of delay (1008.1.9.7)
☐ Location of doors with electromagnetic egress locks (1008.1.9.8)
☐ Location of doors equipped with hold-open devices
☐ Location of emergency escape windows (1029)
☐ The square footage of each fire area (902)
☐ The square footage of each smoke compartment (407.4)
☐ Note any code exceptions or table notes that may have been utilized regarding the items above

EXIT REQUIREMENTS
NUMBER AND ARRANGEMENT OF EXITS

Floor, Room or Space Designation	Minimum[2] Number of Exits		Travel Distance		Arrangement Means of Egress[2,3] (Section 1015.2)	
	Required	Shown on Plans	Allowable Travel Distance (Table 1016.1)	Actual Travel Distance Shown on Plans	Req'd Distance Between Exit Doors	Actual Distance Shown on Plans
First Floor	1	2	200'	46' MAX.	N/A	23'

[1] Corridor dead ends (Section 1017.3)
[2] Buildings with single exits (Table 1019.2), Spaces with one means of egress (Table 1015.1)
[3] Common Path of Travel (Section 1014.3)

EXIT WIDTH

Use Group or Space Description	(a) Area[1] sq. ft.	(b) Area[1] Per Occupant (Table 1004.1.1)	Calculated Occupant Load (a-b)	(c) Egress Width Per Occupant (Table 1005.1)		Exit Width (in)[2,3,4,5,6] Required Width (Section 1005.1) (a-b) x c		Actual Width Shown on Plans	
				Stair	Level	Stair	Level	Stair	Level
Storage	1,395 SF	300 gross	5	N/A	0.2	N/A	1"		64"
TOTAL			5 Occupants		0.2		1"		64"

[1] See Table 1004.1.1 to determine whether net or gross area is applicable.
See definition "Area, Gross" and "Area, Net" (Section 1002)
[2] Minimum stairway width (Section 1009.1); min. corridor width (Section 1017.2); min. door width (Section 1008.1)
[3] Minimum width of exit passageway (Section 1023.2)
[4] See Section 1004.5 for converging exits.
[5] The loss of one means of egress shall not reduce the available capacity to less than 50 percent of the total required (Section 1005.1)
[6] Assembly occupancies (Section 1025)

ACCESSIBLE PARKING: N/A EXISTING

Lot or Parking Area	Total # of Parking Spaces		# of Accessible Spaces Provided		Total # Accessible Provided
	Required	Provided	Regular With 5' Access Aisle	Van Spaces with 8' Access Aisle	
Parking Lot					

STRUCTURAL DESIGN

DESIGN LOADS:
Importance Factors: Wind (I_W) 1.0; Snow (I_S) 1.0; Seismic (I_E) 1.0
Live Loads: Roof 20 psf; Mezzanine N/A psf; Floor N/A psf
Ground Snow Load: 20 psf
Wind Load: Basic Wind Speed 90 mph (ASCE-7); Exposure Category C; Wind Base Shears (for MWFRS) V_X= 5 kips V_Y= 8 kips
SEISMIC DESIGN CATEGORY ☐ A ☐ B ■ C ☐ D
Provide the following Seismic Design Parameters:
Occupancy Category (Table 1604.5) ☐ I ■ II ☐ III ☐ IV
Spectral Response Acceleration S_S 0.293%g S_1 0.104 %
Site Classification D ■ Field Test ☐ Presumptive ☐ Historical Data
Basic structural system (check one)
■ Bearing Wall ☐ Dual w/ Special Moment Frame
☐ Building Frame ☐ Dual w/ Intermediate R/C or Special Steel
☐ Moment Frame ☐ Inverted Pendulum
Seismic base shear V_X = 18 kips V_Y = 18 kips
Analysis Procedure ☐ Simplified ☐ Equivalent Lateral Force ☐ Modal
Architectural, Mechanical, Components anchored? No
☐ LATERAL DESIGN CONTROL: ■ Earthquake ☐ Wind
SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) 3000 psf
Presumptive Bearing capacity _____psf
Pile size, type, and capacity _____

PLUMBING FIXTURE REQUIREMENTS

Use		Waterclosets M	F	Unisex	Urinals	Lavatories M	F	Uni	Showers/Tubs M	F	Unisex	Drinking Fountains Regular	Accessible
S-1 Storage (a)	Provided	0	0	0	0	0	0	0				0	0
	Required	0	0	0	0	0	0	0				0	0

(a) Per 403.1, note n, unheated storage buildings which are used periodically are not required to have toilet rooms.

SPECIAL APPROVALS
Special approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, ICC, etc., describe below)
State Construction Office

ENERGY SUMMARY: SEE MECH. DWGS

ENERGY REQUIREMENTS:

The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designersmall furnish the required portions of the project information for the plan data sheet. If energy cost budget method, state the annual energy cost budget vs. allowable energy cost budget.

Climate Zone: ☐ 3 ☐ 4A ■ 5A
Method of Compliance: ☐ Prescriptive (Energy Code) ☐ Performance (Energy Code) ☐ Prescriptive (ASHRAE 90.1) ☐ Performance (ASHRAE 90.1 2007 for LEED-NC 2009 Compliance)

THERMAL ENVELOPE:

Roof/ceiling Assembly:
Description of assembly: Standing seam metal roof over 6" rigid insulation, 3/4" wood sheathing, wood trusses.
U-Value of total assembly: 0.033
R-Value of Insulation: 30
Skylights in each assembly: U-Value of skylight: N/A

Exterior Walls
Description of assembly: 8" CMU, 2-1/2" rigid insulation. air space, brick veneer
U-Value of total assembly: 0.0625
R-Value of Insulation: 12.5
Openings: (windows or doors with glazing): N/A
U-Value of assembly:
Solar Heat Gain Coefficient:
projection factor:
Door R-Values: 2

Walls adjacent to unconditioned space: N/A
Description of assembly:
U-Value of total assembly:
R-Value of Insulation:
Openings: (windows or doors with glazing)
U-Value of assembly:
Door R-Values:

Walls below grade (each assembly): N/A
Description of assembly:
U-Value of total assembly:
R-Value of Insulation:

Floors over unconditioned space (each assembly): N/A
Description of assembly:
U-Value of total assembly:
R-Value of Insulation:

Floors slab on grade:
Description of assembly: 6" concrete slab over vapor barrier, 6" stone base
U-Value of total assembly: 0.067
R-Value of Insulation: 15
Horizontal/vertical requirement: 24 inches
Slab heated: No

MECHANICAL SUMMARY SEE MECH. DWGS

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT
Thermal Zone: ☐ 3 ☐ 4A ■ 5A
winter dry bulb:
summer dry bulb:
Interior design conditions
winter dry bulb:
summer dry bulb:
relative humidity:
Building heating load:
Building cooling load:
Mechanical Spacing Conditioning System:
Unitary
description of unit:
heating efficiency:
cooling efficiency:
heat output of unit:
cooling output of unit:
Boiler - total boiler output. If oversized, state reason.
Chiller - total chiller capacity. If oversized, state reason.
List equipment efficiencies:
Equipment schedules with motors (mechanical systems)
motor horsepower:
number of phases:
minimum efficiency:
motor type:
# of poles:

ELECTRICAL SUMMARY SEE ELEC. DWGS

ELECTRICAL SYSTEM AND EQUIPMENT
Method of Compliance:
Energy Code: ☐ Prescriptive ☐ Performance
ASHRAE 90.1: ☐ Prescriptive ☐ Performance
Lighting schedule
lamp type required in fixture:
number of lamps in fixture:
ballast type used in the fixture:
number of ballasts in fixture:
total wattage per fixture:
total interior wattage specified vs allowed:
total exterior wattage specified vs allowed:

Additional Prescriptive Compliance
☐ 506.2.1 More Efficient Mechanical Equipment
☐ 506.2.2 Reduced Lighting Power Density
☐ 506.2.3 Energy Recovery Ventilation System
☐ 506.2.4 Higher Efficiency Service Water Heating
☐ 506.2.5 On-site Supply of Renewable Energy
☐ 506.2.6 Automatic Daylighting Control System

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

Building Code Summary
Storage Building

MIKE COX REGISTERED ARCHITECT 2653 10/18/16 ASHEVILLE, N.C. NORTH CAROLINA

ARCHITECTURAL DESIGN STUDIO PA REGISTERED ARCHITECTURAL CORPORATION CERT.NO 50382 ASHEVILLE NC NORTH CAROLINA

T-2

UL Design Assembly U419

New 1-hour rated stud walls shall be constructed per the requirements of this assembly.
Reprinted from the Online Certifications Directory with permission from UL.

BXUV - Fire Resistance Ratings - ANSI/UL 263

BXUV7 - Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

See General Information for Fire-resistance Ratings - ANSI/UL 263

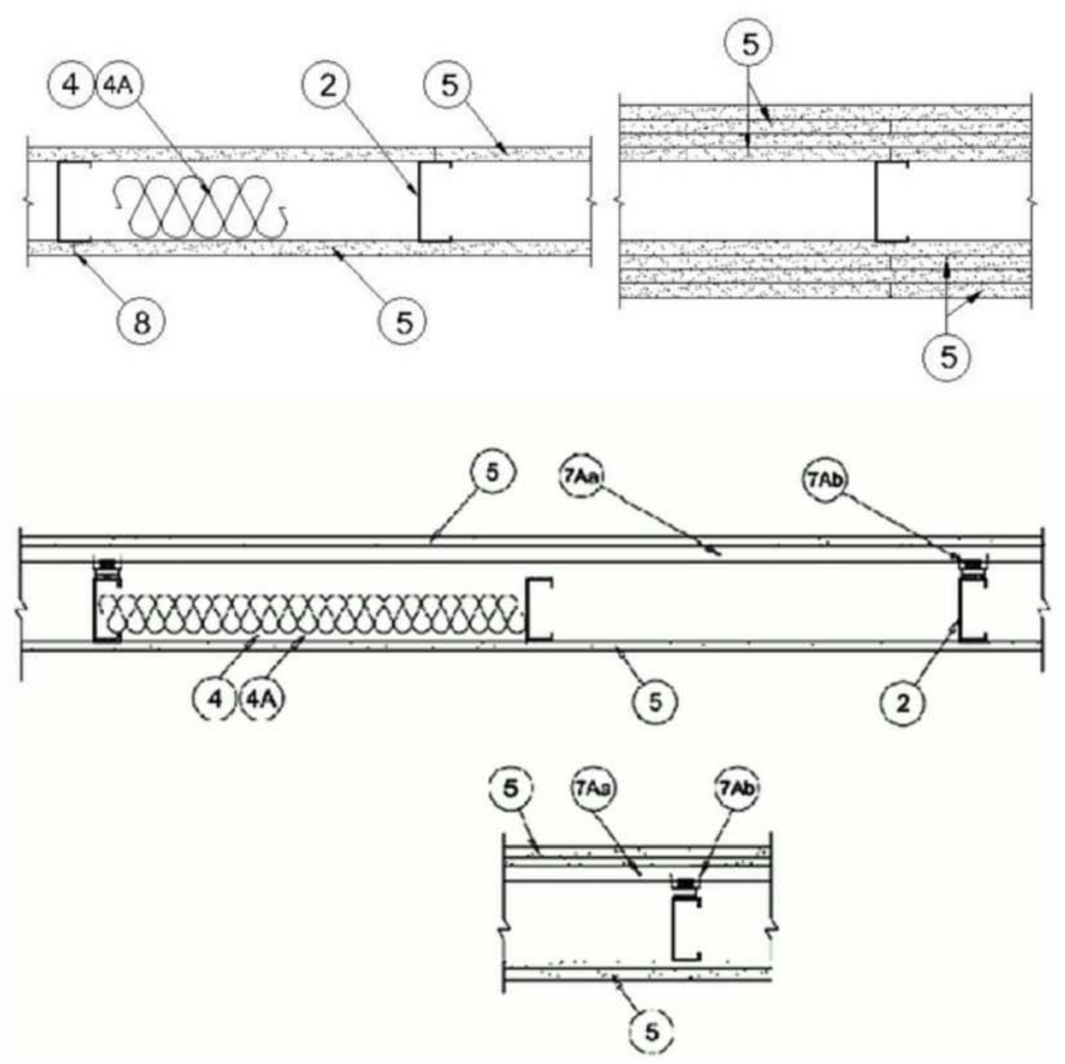
See General Information for Fire Resistance Ratings - CAN/ULC-S101 Certified for Canada

Design No. U419

August 25, 2016

Nonbearing Wall Ratings — 1, 2, 3 or 4 Hr (See Items 4 & 5 through 5K)

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**



1. **Floor and Ceiling Runners —** (Not Shown) — For use with Item 2 — Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth to accommodate stud size, with min 1-1/4 in. long legs, attached to floor and ceiling with fasteners 24 in. OC max.

1A. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2B, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper25™ Track

CRACO MFG INC — SmartTrack25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™ Track

1B. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2C, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper20™ Track

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track

1C. **Framing Members* — Floor and Ceiling Runners —** (Not Shown) — In lieu of Item 1 — Channel shaped, attached to floor and ceiling with fasteners 24 in. OC. max.

ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME Framing System

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME Framing System

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME Framing System

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System

UNITED METAL PRODUCTS INC — Type SUPREME Framing System

1D. **Floor and Ceiling Runners —** (Not Shown) — For use with Item 2A — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, min depth to accommodate stud size, with min 1 in. long legs, attached to floor and ceiling with fasteners spaced max 24 in. OC.

1E. **Framing Members* — Floor and Ceiling Runners —** (Not Shown, As an alternate to Item 1) — For use with Items 2E, 5F or 5G or 5I only, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.

CLARKDIETRICH BUILDING SYSTEMS — CD ProTRAK

DMFCWBS L L C — ProTRAK

MBA METAL FRAMING — ProTRAK

RAM SALES L L C — Ram ProTRAK

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProTRAK

1F. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2F, proprietary channel shaped runners, minimum width to accommodate stud size, with 1- 1/8 in. long legs fabricated from min 0.015 in. (min bare metal thickness) galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

SUPER STUD BUILDING PRODUCTS — The Edge

1G. **Framing Members* — Floor and Ceiling Runner —** For use with Item 2G, proprietary channel shaped runners, minimum width to accommodate stud size attached to floor and ceiling with fasteners 24 in. OC max.

STUDCO BUILDING SYSTEMS — CROCSTUD Track

1H. **Floor and Ceiling Runners —** (Not Shown) — Channel shaped, fabricated from min 0.02 in. galv steel, min width to accommodate stud size, with min 1 in. long legs, for use with studs specified below and fabricated from min 0.02 in. galv steel or thicker, attached to floor and ceiling with fasteners spaced max 24 in. OC.

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™ Track VT100

1I. **Framing Members* — Floor and Ceiling Runners —** (Not Shown, As an alternate to Item 1) — For use with Items 2H, channel shaped, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, attached to floor and ceiling with fasteners 24 in. OC. max.

TELLING INDUSTRIES L L C — TRUE-TRACK™

1J. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2I, proprietary channel shaped runners, 3-5/8 in. deep attached to floor and ceiling with fasteners 24 in. OC max.

TELLING INDUSTRIES L L C — Viper25™ Track

1K. **Framing Members* — Floor and Ceiling Runner —** Not Shown — In lieu of Item 1 — For use with Item 2J, proprietary channel shaped runners, 1-1/4 in. wide by 3-5/8 in. deep fabricated from min 0.020 in. thick galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

TELLING INDUSTRIES L L C — Viper20™ Track

1M. **Framing Members* — Floor and Ceiling Runners —** Not Shown — As an alternate to Item 1 — For use with Item 2O, proprietary channel shaped runners, min width to accommodate stud size, galv steel, attached to floor and ceiling with fasteners spaced 24 in. OC max.

RONDO BUILDING SERVICES PTY LTD — Rondo Wall Track

2. **Steel Studs —** Channel shaped, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

2A. **Steel Studs —** (As an alternate to Item 2, For use with Items 5B, 5E, 5H, 5J and 5K) — Channel shaped, fabricated from min 20 MSG corrosion-protected or galv steel, 3-1/2 in. min depth, spaced a max of 16 in. OC. Studs friction-fit into floor and ceiling runners. Studs to be cut 5/8 to 3/4 in. less than assembly height.

2B. **Framing Members* - Steel Studs —** (As an alternate to Item 2, For use with Items 5C, 5I or 5K) — Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a 1/2 in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper25™

CRACO MFG INC — SmartStud25™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper25™

2C. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.020 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights.

CALIFORNIA EXPANDED METAL PRODUCTS CO — Viper20™

MARINO/WARE, DIV OF WARE INDUSTRIES INC — Viper20™

2D. **Framing Members* — Steel Studs —** In lieu of Item 2 — Channel shaped studs, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

ALLSTEEL & GYPSUM PRODUCTS INC — Type SUPREME Framing System

CONSOLIDATED FABRICATORS CORP, BUILDING PRODUCTS DIV — Type SUPREME Framing System

QUAIL RUN BUILDING MATERIALS INC — Type SUPREME Framing System

SCAFCO STEEL STUD MANUFACTURING CO — Type SUPREME Framing System

STEEL CONSTRUCTION SYSTEMS INC — Type SUPREME Framing System

UNITED METAL PRODUCTS INC — Type SUPREME Framing System

2E. **Framing Members* — Steel Studs —** (Not Shown, As an alternate to Item 2) — For use with Items 5F or 5G or 5I or 5K only, channel shaped studs, min depth as indicated under Item 5F, 5G or 5I, fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

CLARKDIETRICH BUILDING SYSTEMS — CD ProSTUD

DMFCWBS L L C — ProSTUD

MBA METAL FRAMING — ProSTUD

RAM SALES L L C — Ram ProSTUD

STEEL STRUCTURAL PRODUCTS L L C — Tri-S ProSTUD

2F. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, minimum width indicated under Item 5, 1-1/4 in. deep fabricated from min 0.015 in. (min bare metal thickness) galvanized steel. Studs 3/8 in. to 3/4 in. less in lengths than assembly heights.

SUPER STUD BUILDING PRODUCTS — The Edge

2G. **Framing Members* — Steel Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped studs, minimum width indicated under Item 5, Studs to be cut 3/8 to 3/4 in less than the assembly height.

STUDCO BUILDING SYSTEMS — CROCSTUD

2H. **Framing Members* — Steel Studs —** (Not Shown, As an alternate to Item 2) — Fabricated from min. 0.015 in. (min bare metal thickness) galvanized steel, spaced a max of 24 in. OC. Studs to be cut 3/4 in. less than assembly height.

TELLING INDUSTRIES L L C — TRUE-STUD™

2I. **Framing Members* — Steel Studs —** (As an alternate to Item 2, For use with Items 5C or 5L or 5K) — Proprietary channel shaped studs, 3-5/8 in. deep spaced a max of 24 in. OC. Studs to be cut 3/4 in less than the assembly height and installed with a 1/2 in. gap between the end of the stud and track at the bottom of the wall. For direct attachment of gypsum board only.

TELLING INDUSTRIES L L C — Viper25™

2J. **Framing Members* — Metal Studs —** Not Shown — In lieu of Item 2 — proprietary channel shaped steel studs, min depth as indicated under Item 5, spaced a max if 24 in. OC, fabricated from min 0.020 in. thick galv steel. Studs cut 3/8 in. to 3/4 in. less in lengths than assembly heights

TELLING INDUSTRIES L L C — Viper20™

2K. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

EB MéTAL INC — EB Stud

2L. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

OLMAR SUPPLY INC — PRIMESTUD

2M. **Framing Members* — Steel Studs —** As an alternate to Item 2 — For use with Item 1, channel shaped studs, fabricated from min 25 MSG corrosion-protected steel, min depth as indicated under Item 5, spaced a max of 24 in. OC. Studs to be cut 3/8 to 3/4 in. less than assembly height.

MARINO/WARE, DIV OF WARE INDUSTRIES INC — StudRite™

2O. **Framing Members* — Steel Studs —** As an alternate to Item 2 — proprietary channel shaped steel studs, min width as indicated under Item 5, galv steel. Studs to be cut 3/8 to 3/4 in. less in lengths than assembly height. Spaced 24 in. OC max.

RONDO BUILDING SERVICES PTY LTD — Rondo Lipped Wall Stud

3. **Wood Structural Panel Sheathing —** (Optional, For use with Item 5 Only) — (Not Shown) — 4 ft wide, 7/16 in. thick oriented strand board (OSB) or 15/32 in. thick structural 1 sheathing (plywood) complying with DOC PS1 or PS2, or APA Standard PRP-108, manufactured with exterior glue, applied horizontally or vertically to the steel studs. Vertical

joints centered on studs, and staggered one stud space from wallboard joints. Attached to studs with flat-head self-drilling tapping screws with a min. head diam. of 0.292 in. at maximum 6 in. OC. in the perimeter and 12 in. OC. in the field. When used, gypsum panels attached over OSB or plywood panels and fastener lengths for gypsum panels increased by min. 1/2 in.

4. **Batts and Blankets* —** (Required as indicated under Item 5) — Mineral wool batts, friction fitted between studs and runners. Min nom thickness as indicated under Item 5.

See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

4A. **Batts and Blankets* —** (Optional) — Placed in stud cavities, any glass fiber or mineral wool insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance.

See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

4B. **Batts and Blankets* —** For use with Item 5K. Placed in stud cavities, any min. 3-1/2 in. thick glass fiber insulation bearing the UL Classification Marking as to Surface Burning Characteristics and/or Fire Resistance.

See **Batts and Blankets** (BKNV or BZJZ) Categories for names of Classified companies.

5. **Gypsum Board* —** Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2, 2C, 2D, 2F, 2G, 2O	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4)
1	3-1/2	1 layer, 5/8 in. thick	Optional
1	2-1/2	1 layer, 1/2 in. thick	1-1/2 in.
1	1-5/8	1 layer, 3/4 in. thick	Optional
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
2	3-1/2	1 layer, 3/4 in. thick	3 in.
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	2 layers, 3/4 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional
4	2-1/2	2 layers, 3/4 in. thick	2 in.

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR; WRC, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX or WRC; 3/4 in. thick Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type SCX, SGX, SHX, WRX, IP-X1, AR, C, WRC, FRX-G, IP-AR, IP-X2, IPC-AR ; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL ZAWAWI DRYWALL L L C SFZ — 1/2 in. Type C; 5/8 in. Types C, SCX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or WRC; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, WRX, WRC or; 3/4 in. thick Types IP-X3 or ULTRACODE

When Item 7B, **Steel Framing Members***, is used, Nonbearing Wall Rating is limited to 1 Hr. Min. stud depth is 3-1/2 in., min. thickness of insulation (Item 4) is 3 in., and two layers of gypsum board panels (1/2 in. or 5/8 in. thick) shall be attached to furring channels as described in Item 6. One layer of gypsum board panels (1/2 in. or 5/8 in. thick) attached to opposite side of stud without furring channels as described in Item 6.

5A. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 24 to 54 in. wide, applied horizontally as the outer layer to one side of the assembly. Secured as described in Item 6.

CGC INC — Type SHX.

UNITED STATES GYPSUM CO — Type FRX-G, SHX.

USG MEXICO S A DE C V — Type SHX.

5B. **Gypsum Board* —** (Not Shown) — As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 in or 3/4 in. thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) — Nom 5/8 in. or ¾ in. may be used as alternate to all 5/8 in. or ¾ in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 in. or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Gypsum board secured to 20 MSG steel studs Item 2A with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. To be used with Lead Batten Strips (see Item 11) or Lead Discs or Tabs (see Item 12).

RAY-BAR ENGINEERING CORP — Type RB-LBG

5C. **Gypsum Board* —** (For Use With Item 2B) — Rating Limited to 1 Hour. 5/8 in. thick, 48 in. wide, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. (Vertical Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. Vertical joints are to be centered over studs and staggered one stud cavity on opposite sides of studs. (Horizontal Application) - The gypsum board is to be installed on each side of the studs with 1 in. long Type S coated steel screws spaced 8 in. OC starting 4 in. from the edge of the board at the vertical edges and 12 in. OC starting 6 in. from the edge of the board at the center of each board. Gypsum boards are to be secured to the top and bottom track with screws spaced 8 in. OC starting 4 in. from the board edge. Fasteners shall not penetrate through both the stud and the track at the same time. All horizontal joints are to be backed as outlined under section VI of Volume 1 in the Fire Resistive Directory.

CGC INC — Type SCX.

UNITED STATES GYPSUM CO — Type SCX, SGX.

USG BORAL ZAWAWI DRYWALL L L C SFZ — Type SCX

USG MEXICO S A DE C V — Type SCX

5D. **Gypsum Board* —** (As an alternate to Item 5) — 5/8 in. thick, 48 in. wide, applied vertically or horizontally. Secured as described in Item 6. For use with Items 1 and 2 only.

CGC INC — Type USGX

UNITED STATES GYPSUM CO — Type USGX

USG MEXICO S A DE C V — Type USGX

5E. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nominal 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 (or No. 6 by 1-1/4 in. long bugle head fine driller) steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field.

NEW ENGLAND LEAD BURNING CO INC, DBA NELCO — Nelco

5F. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1E and 2E and limited to 1 Hour Rating only, Gypsum panels with beveled, square or tapered edges, applied vertically, and fastened to the steel studs with 1 in. long Type S screws spaced 8 in. OC along vertical and bottom edges and 12 in. OC in the field. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Steel stud depth shall be a minimum 3-5/8 in.

UNITED STATES GYPSUM CO — 5/8 in. thick Type SCX, SGX

USG BORAL ZAWAWI DRYWALL L L C SFZ — 5/8 in. thick Type SCX

5G. **Gypsum Board* —** (As an alternate to Item 5) — For use with Items 1E and 2E only, Gypsum panels with beveled, square or tapered edges, applied vertically or horizontally, as specified in the table below and fastened to the steel studs as described in Item 6. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) staggered a min of 12 in. The thickness and number of layers for the 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Item 2E	No. of Layers & Thickness of Panel	Min Thkns of Insulation (Item 4)
2	1-5/8	2 layers, 1/2 in. thick	Optional
2	1-5/8	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 1/2 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 1/2 in. thick	Optional

CGC INC — 1/2 in. thick Type C, IP-X2 or IPC-AR;, 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE

UNITED STATES GYPSUM CO — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type SCX, SGX, SHX, IP-X1, AR, C, , FRX-G, IP-AR, IP-X2, IPC-AR ; 3/4 in. thick Types IP-X3 or ULTRACODE

USG BORAL ZAWAWI DRYWALL L L C SFZ — 1/2 in. Type C; 5/8 in. Types C, SCX, ULTRACODE

USG MEXICO S A DE C V — 1/2 in. thick Type C, IP-X2, IPC-AR or; 5/8 in. thick Type AR, C, IP-AR, IP-X1, IP-X2, IPC-AR, SCX, SHX, or; 3/4 in. thick Types IP-X3 or ULTRACODE

5H. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 5/8 or 3/4 in thick products are specified. For direct attachment only to steel studs Item 2A, (not to be used with Item 3) - Nom 5/8 or 3/4 in. may be used as alternate to all 5/8 or 3/4 in. shown in Item 5, Wallboard Protection on Each Side of Wall table. Nom 5/8 or 3/4 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over 20 MSG steel studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Gypsum board secured to 20 MSG steel studs Item 2B with 1-1/4 in. long Type S-12 steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. For Joint Compound see Item 5. To be used with Lead Batten Strips (see Item 11A) or Lead Discs (see Item 12A).

MAYCO INDUSTRIES INC — Type X-Ray Shielded Gypsum

5I. **Gypsum Board* —** (As an alternate to Item 5) — Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges installed as described in Item 5. Steel stud minimum depth shall be as indicated in Item 5.

CGC INC — Type ULX

UNITED STATES GYPSUM CO — Type ULX

USG MEXICO S A DE C V — Type ULX

5J. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5 when used as the base layer on one or both sides of wall when 1/2 in. or 5/8 in thick products are specified, For direct attachment only to steel studs Item 2A, not to be used with Item 3). Nom 5/8 in. thick lead backed gypsum panels with beveled, square or tapered edges, applied vertically. Vertical joints centered over studs and staggered min 1 stud cavity on opposite sides of studs. Wallboard secured to studs with 1-1/4 in. long Type S-12 steel screws gypsum panel steel screws spaced 8 in. OC at perimeter and 12 in. OC in the field. Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations. Lead batten strips, min 2 in. wide, max 8 ft long with a max thickness of 0.14 in. placed on the face of studs and attached to the stud with construction adhesive and two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead discs, nominal 3/8 in. diam by max 0.085 in. thick. Compression fitted or adhered over the screw heads. Lead batten strips and discs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

RADIATION PROTECTION PRODUCTS INC — Type RPP - Lead Lined Drywall

5K. **Gypsum Board* —** (Not Shown) — (As an alternate to Item 5) — Nom. 5/8 in. thick gypsum panels with beveled, square or tapered edges, applied vertically or horizontally. Vertical joints centered over studs and staggered one stud cavity on opposite sides of studs. Vertical joints in adjacent layers (multilayer systems) staggered one stud cavity. Horizontal joints need not be backed by steel framing. Horizontal edge joints and horizontal butt joints on opposite sides of studs need not be staggered. Horizontal edge joints and horizontal butt joints in adjacent layers (multilayer systems) need not be staggered. The number of layers for the 1 hr, 2 hr, 3 hr and 4 hr ratings are as follows:

Gypsum Board Protection on Each Side of Wall

Rating, Hr	Min Stud Depth, in. Items 2 through 2O	No. of Layers & Thkns of Panel	Min Thkns of Insulation (Item 4B)
1	3-5/8	1 layer, 5/8 in. thick	3-1/2 in.
2	1-5/8	2 layers, 5/8 in. thick	Optional
3	1-5/8	3 layers, 5/8 in. thick	Optional
4	1-5/8	4 layers, 5/8 in. thick	Optional

UNITED STATES GYPSUM CO — 5/8 in. thick Type ULIX

6. **Fasteners —** (Not Shown) — For use with Items 2 and 2F - Type S or S-12 steel screws used to attach panels to studs (Item 2) or furring channels (Item 7). **Single layer systems:** 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. **Two layer systems:** First layer- 1 in. long for 1/2 and 5/8 in. thick panels or 1-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels or 2-1/4 in. long for 3/4 in. thick panels, spaced 16 in. OC with screws offset 8 in. from first layer.**Three-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in., 5/8 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below. **Four-layer systems:** First layer- 1 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Second layer- 1-5/8 in. long for 1/2 in., 5/8 in. thick panels, spaced 24 in. OC. Third layer- 2-1/4 in. long for 1/2 in. thick panels or 2-5/8 in. long for 5/8 in. thick panels, spaced 24 in. OC. Fourth layer- 2-5/8 in. long for 1/2 in. thick panels or 3 in. long for 5/8 in. thick panels, spaced 12 in. OC. Screws offset min 6 in. from layer below.

6A. **Fasteners —** (Not Shown) — For use with Item 5K- Type S or S-12 steel screws used to attach panels to studs or furring channels (Item 7). Single layer systems: 1 in. long screws, spaced 8 in. OC when panels are applied horizontally, or 8 in. OC along vertical and bottom edges and 12 in. OC in the field when panels are applied vertically. Two layer systems: First layer- 1 in. long screws, spaced 16 in. OC. Second layer- 1-5/8 in. screws, spaced 8 in. OC with screws offset 8 in. from first layer. Three-layer systems: First layer- 1 in. long screws, spaced 24 in. OC. Second layer- 1-5/8 in. long screws, spaced 24 in. OC. Third layer- 2-5/8 in. long screws, spaced 8 in. OC. Screws offset min 6 in. from layer below. Four-layer systems: First layer- 1 in. long screws, spaced 24 in. OC. Second layer- 1-5/8 in. long screws, spaced 24 in. OC. Third layer- 2-5/8 in. long screws, spaced 24 in. OC. Fourth layer- 3 in. long screws, spaced 8 in. OC. Screws offset min 6 in. from layer below.

7. **Furring Channels** — (Optional, Not Shown, for single or double layer systems) — Resilient furring channels fabricated from min 25 MSG corrosion-protected steel, spaced vertically a max of 24 in. OC. Flange portion attached to each intersecting stud with 1/2 in. long Type S-12 steel screws. Not for use with Item 5A and 5E.

7A. **Framing Members*** — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. **Furring Channels** — Formed of No. 25 MSG galv steel. 2-9/16 in. or 2-23/32 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. RSIC-1 and RSIC-1 (2.75) clips secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. RSIC-V and RSIC-V (2.75) clips secured to studs with No. 8 x 9/16 in. minimum self-drilling, S-12 steel screw through the center hole. Furring channels are friction fitted into clips. RSIC-1 and RSIC-V clips for use with 2-9/16 in. wide furring channels. RSIC-1 (2.75) and RSIC-V (2.75) clips for use with 2-23/32 in. wide furring channels.

PAC INTERNATIONAL L L C — Types RSIC-1, RSIC-V, RSIC-1 (2.75), RSIC-V (2.75).

7B. **Framing Members*** — (Optional, Not Shown) — As an alternate to Item 7, for single or double layer systems, furring channels and Steel Framing Members on only one side of studs as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel, spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Batts and Blankets placed in stud cavity as described in Item 5. Two layers of gypsum board attached to furring channels as described in Item 5. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Ba) to one side of studs (Item 2) only. Clips spaced 48 in. OC., and secured to studs with two No. 8 x 2-1/2 in. coarse drywall screws, one through the hole at each end of the clip. Furring channels are friction fitted into clips.

KINETICS NOISE CONTROL INC — Type Isomax

7C. **Framing Members* —** (Not Shown) — (Optional on one or both sides, not shown, for single or double layer systems) — As an alternate to Item 7, furring channels and Steel Framing Members as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Gypsum board attached to furring channels as described in Item 6. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Aa) to studs (Item 2). Clips spaced max. 48 in. OC. GENIECLIPS secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.

PLITEQ INC — Type GENIECLIP

7D. **Steel Framing Members* —** (Optional, Not Shown) — Furring channels and Steel Framing Members as described below:

a. **Furring Channels —** Formed of No. 25 MSG galv steel. Spaced 24 in. OC perpendicular to studs. Channels secured to studs as described in Item b. Ends of adjoining channels overlapped 6 in. and secured together with four self-tapping No. 8x1/2 Self Drilling screws (2 per side 1 in. and 4 in. from overlap edge). Gypsum board attached to furring channels as described in Item 4. Side joint furring channels shall be attached to studs with RESILMOUNT Sound Isolation Clips - located approximately 2 in. from each end of length of channel. Both Gypsum Boards at side joints fastened into channel with screws spaced 8 in. OC, approximately 1/2 in. from joint edge. Not for use with Item 5A and 5E.

b. **Steel Framing Members* —** Used to attach furring channels (Item 7Da) to studs. Clips spaced 24 in. OC., and secured to studs with No. 10 x 2-1/2 in. coarse drywall screw through the center hole. Furring channels are friction fitted into clips.

STUDCO BUILDING SYSTEMS — RESILMOUNT Sound Isolation Clips - Type A237 or A237R

8. **Joint Tape and Compound —** Vinyl or casein, dry or premixed joint compound applied in two coats to joints and screw heads of outer layers. Paper tape, nom 2 in. wide, embedded in first layer of compound over all joints of outer layer panels. Paper tape and joint compound may be omitted when gypsum panels are supplied with a square edge.

9. **Siding, Brick or Stucco —** (Optional, Not Shown) — Aluminum, vinyl or steel siding, brick veneer or stucco, meeting the requirements of local code agencies, installed over gypsum panels. Brick veneer attached to studs with corrugated metal wall ties attached to each stud with steel screws, not more than each sixth course of brick.

10. **Caulking and Sealants* —** (Optional, Not Shown) — A bead of acoustical sealant applied around the partition perimeter for sound control.

UNITED STATES GYPSUM CO — Type AS

11. **Lead Batten Strips —** (Not Shown, For Use With Item 5B) — Lead batten strips, min 1-1/2 in. wide, max 10 ft long with a max thickness of 0.125 in. Strips placed on the interior face of studs and attached from the exterior face of the stud with two 1 in. long Type S-12 pan head steel screws, one at the top of the strip and one at the bottom of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5B) and optional at remaining stud locations. Required behind vertical joints.

11A. **Lead Batten Strips —** (Not Shown, For Use With Item 5H) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.140 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.5% meeting the Federal specification QQ-L-201f, Grades "B, C or D". Lead batten strips required behind vertical joints of lead backed gypsum wallboard and optional at remaining stud locations.

12. **Lead Discs or Tabs —** (Not Shown, For Use With Item 5B) — Used in lieu of or in addition to the lead batten strips (Item 11) or optional at other locations - Max 3/4 in. diam by max 0.125 in. thick lead discs compression fitted or adhered over steel screw heads or max 1/2 in. by 1-1/4 in. by max 0.125 in. thick lead tabs placed on gypsum boards (Item 5B) underneath screw locations prior to the installation of the screws. Lead discs or tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C".

12A. **Lead Discs —** (Not Shown, for use with Item 5H) — Max 5/16 in. diam by max 0.140 in. thick lead discs compression fitted or adhered over steel screw heads. Lead discs to have a purity of 99.5% meeting the Federal Specification QQ-L-201f, Grades "B, C or D".

13. **Lead Batten Strips —** (Not Shown, For Use With Item 5E) — Lead batten strips, 2 in. wide, max 10 ft long with a max thickness of 0.142 in. Strips placed on the face of studs and attached to the stud with two min. 1 in. long min. Type S-8 pan head steel screws, one at the top of the strip and one at the bottom of the strip or with one min. 1 in. long min. Type S-8 pan head steel screw at the top of the strip. Lead batten strips to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead batten strips required behind vertical joints of lead backed gypsum wallboard (Item 5E) and optional at remaining stud locations.

14. **Lead Tabs —** (Not Shown, For Use With Item 5E) — 2 in. wide, 5 in. long with a max thickness of 0.142 in. Tabs friction-fit around front face of stud, the stud folded back flange, and the back face of the stud. Tabs required at each location where a screw (that secures the gypsum boards, Item 5E) will penetrate the steel stud. Lead tabs to have a purity of 99.9% meeting the Federal specification QQ-L-201f, Grade "C". Lead tabs may be held in place with standard adhesive tape if necessary.

*** Indicates such products shall bear the UL or cUL Certification Mark for jurisdictions employing the UL or cUL Certification (such as Canada), respectively.**

Last Updated on 2016-08-25

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportattion, Raleigh, NC SCO # 141126301A

UL Assembly

architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

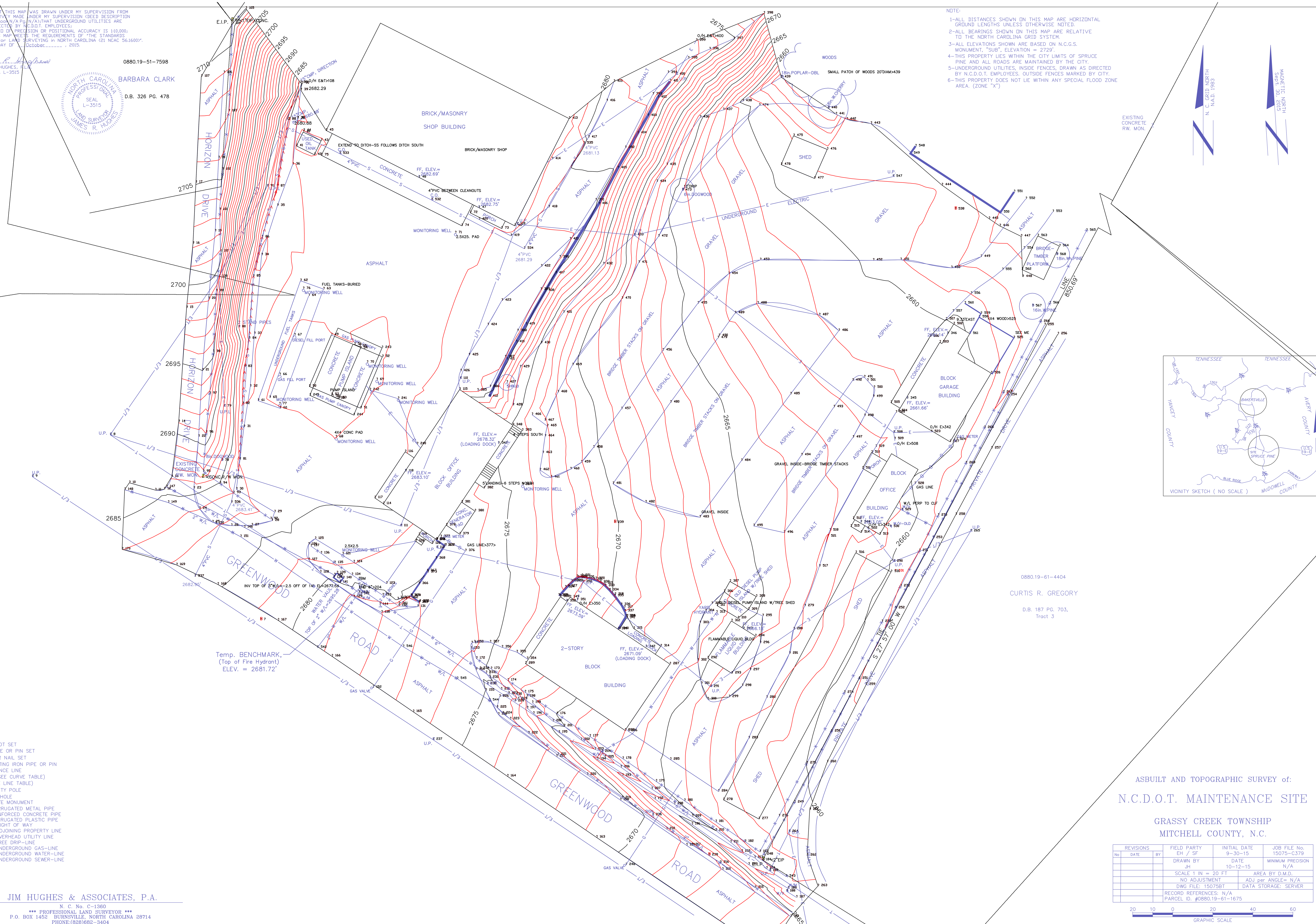
MIKE COX REGISTERED ARCHITECT 2653 10/18/16 NORTH CAROLINA ASHEVILLE N.C.

ARCHITECTURAL DESIGN STUDIO PA REGISTERED ARCHITECTURAL CORPORATION CERT.NO 50382 NORTH CAROLINA ASHEVILLE NC

I CERTIFY THAT THIS MAP WAS DRAWN UNDER MY SUPERVISION FROM AN ACTUAL SURVEY MADE UNDER MY SUPERVISION (DEED DESCRIPTION RECORDED IN Book N/A Pg. N/A); THAT UNDERGROUND UTILITIES ARE DRAWN AS DIRECTED BY N.C.D.O.T. EMPLOYEES; THAT THE RATIO OF PRECISION OR POSITIONAL ACCURACY IS 1:10,000; AND THAT THIS MAP MEETS THE REQUIREMENTS OF "THE STANDARDS of PRACTICE for LAND SURVEYING in NORTH CAROLINA (21 NCAC 56.1600)". THIS __12th DAY OF __October______ , 2015.

James R. Hughes
JAMES R. HUGHES, P.L.S.
N.C. NO. L-3515

NORTH CAROLINA PROFESSIONAL SEAL L-3515 LAND SURVEYOR JAMES R. HUGHES



NOTE:

1-ALL DISTANCES SHOWN ON THIS MAP ARE HORIZONTAL GROUND LENGTHS UNLESS OTHERWISE NOTED.
2-ALL BEARINGS SHOWN ON THIS MAP ARE RELATIVE TO THE NORTH CAROLINA GRID SYSTEM.
3-ALL ELEVATIONS SHOWN ARE BASED ON N.C.G.S. MONUMENT, "SUB", ELEVATION = 2729'.
4-THIS PROPERTY LIES WITHIN THE CITY LIMITS OF SPRUCE PINE AND ALL ROADS ARE MAINTAINED BY THE CITY.
5-UNDERGROUND UTILITIES, INSIDE FENCES, DRAWN AS DIRECTED BY N.C.D.O.T. EMPLOYEES. OUTSIDE FENCES MARKED BY CITY.
6-THIS PROPERTY DOES NOT LIE WITHIN ANY SPECIAL FLOOD ZONE AREA. (ZONE "X")

LEGEND:

- ....POINT NOT SET
- ....IRON PIPE OR PIN SET
- ....SPIKE OR NAIL SET
- E.I.P. = EXISTING IRON PIPE OR PIN
- —x—x— FENCE LINE
- C= CURVE (SEE CURVE TABLE)
- L= LINE (SEE LINE TABLE)
- U.P.= UTILITY POLE
- M.H.= MANHOLE
- ....CONCRETE MONUMENT
- C.M.P. = CORRUGATED METAL PIPE
- R.C.P. = REINFORCED CONCRETE PIPE
- C.P.P. = CORRUGATED PLASTIC PIPE
- — — — RIGHT OF WAY
- ——— ADJOINING PROPERTY LINE
- — T — OVERHEAD UTILITY LINE
- ——— TREE DRIP-LINE
- — G — UNDERGROUND GAS-LINE
- — W — UNDERGROUND WATER-LINE
- — S — UNDERGROUND SEWER-LINE

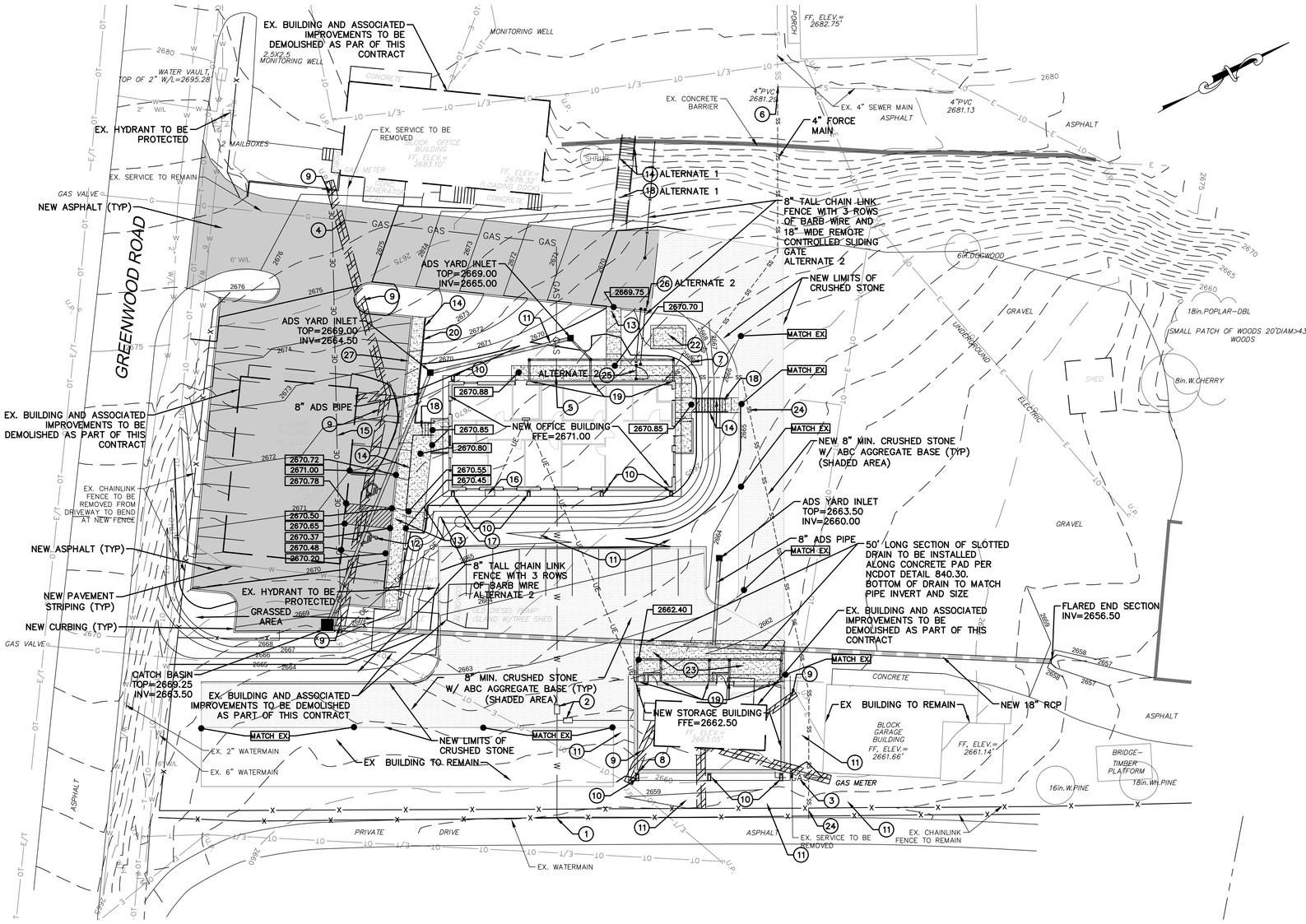
JIM HUGHES & ASSOCIATES, P.A.
N. C. No. C-1360
*** PROFESSIONAL LAND SURVEYOR ***
P.O. BOX 1452 BURNSVILLE, NORTH CAROLINA 28714
PHONE:(828)682-3404

ASBUILT AND TOPOGRAPHIC SURVEY of:

N.C.D.O.T. MAINTENANCE SITE

GRASSY CREEK TOWNSHIP
MITCHELL COUNTY, N.C.

REVISIONS			FIELD PARTY	INITIAL DATE	JOB FILE No.
No	DATE	BY	EH / SF	9-30-15	15075-C379
			DRAWN BY JH	DATE 10-12-15	MINIMUM PRECISION N/A
			SCALE 1 IN = 20 FT	AREA BY D.M.D.	
			NO ADJUSTMENT	ADJ per ANGLE= N/A	
			DWG FILE: 15075BT	DATA STORAGE: SERVER	
			RECORD REFERENCES: N/A PARCEL ID. #0880.19-61-1675		



NOTES;

1. CONNECT NEW 2" WATER TO EXISTING MAIN. PROVIDE NEW VAULT WITH VALVE.
2. PROVIDE NEW WATER VAULT AND METER.
3. PROVIDE NEW ¾" NATURAL GAS LINE TO NEW STORAGE BUILDING.
4. CONNECT NEW ¾" NATURAL GAS LINE TO EXISTING ¾" NATURAL GAS LINE AND EXTEND TO NEW GAS METER AT NEW OFFICE BUILDING
5. NEW NATURAL GAS METER BY LOCAL AUTHORITY.
6. CONNECT NEW 4" PVC FORCE MAIN SANITARY SEWER TO EXISTING 4" PVC GRAVITY SANITARY SEWER LINE.
7. NEW SANITARY SEWER GRINDER PUMP AND VAULT.
8. CONNECT ELECTRICAL DOWN TO EXISTING UTILITY POLE. PROVIDE POLE MOUNTED TRANSFORMER.
9. CONTRACTOR TO COORDINATE WITH AND ASSIST LOCAL UTILITY FOR REMOVAL OF OVERHEAD POWER, METER, METER BASE, ETC.
10. ROOF GUTTER SYSTEM WITH SPLASH BLOCKS.
11. SWALE FOR STORM WATER MANAGEMENT.
12. NEW ADA STRIPING AND SIGNAGE.
13. ADA RAMP.
14. HANDRAIL. (REFER TO SP-2 FOR DETAILS). PART OF ALTERNATE 1 IN ONE LOCATION.
15. NEW OVERHEAD ELECTRICAL TO RE-FEED EXISTING POLE.
16. NEW ELECTRIC METER.
17. NEW UTILITY POLE.
18. NEW STAIRS (REFER TO SP-2 FOR DETAILS) PART OF ALTERNATE 1 IN ONE LOCATION.
19. NEW ROOF LEADER DRAINAGE SYSTEM TO TIE INTO NEW UNDERGROUND PIPE.
20. NEW ELEVATED SIDEWALK WITH SEGMENTED BLOCK RETAINING WALL (REFER TO SP-2 FOR DETAILS)
21. GRASS ALL DISTURBED AREAS.
22. RELOCATE EXISTING GENERATOR TO NEW 8" THICK CONCRETE HOUSEKEEEPING PAD.
23. NEW CONCRETE PAVEMENT.
24. ALTERNATE SANITARY SEWER. CONTRACTOR SHALL VERIFY LOCATION, SIZE, DEPTH AND CONDITION OF EXISTING SANITARY SEWER NEAR PROPERTY BOUNDARY. CONTRACTOR SHALL PROVIDE INFORMATION TO THE ENGINEER IMMEDIATELY AND DETERMINATION WILL BE MADE IF SEWER CONNECTION IS FEASIBLE. IF FEASIBLE THIS ALTERNATE MAY BE SELECTED IN LIEU OF INSTALLATION OF PUMP AND FORCEMAIN.
25. 4' WIDE PERSONAL FENCE GATE. PART OF ALTERNATE 2
26. NEW ROLLING GATE. PART OF ALTERNATE 2
27. NEW 6" VERTICAL CURB TO BE INSTALLED ALONG PORTION OF PARKING WHERE HIGHER THAN FFE

NOTE;
ALL UNDERGROUND LINES OUTSIDE OF BUILDING FOOTPRINT INCLUDING THOSE DISCOVERED BY EXCAVATION, EXCEPT LAWN IRRIGATION LINES, SHALL BE REQUIRED TO HAVE A WARNING TAPE INSTALLED IN THE BACKFILL BETWEEN 6 INCHES TO 24 INCHES BELOW FINISHED GRADE DIRECTLY OVER PIPING;

1. METALLIC LINES SHALL BE IDENTIFIED WITH DURABLE PRINTED PLASTIC WARNING TAPES, MINIMUM 3 INCHES WIDE WITH LETTERING TO IDENTIFY BURIED LINE BELOW.
2. NON-METALLIC PIPES, OTHER THAN GAS LINES SHALL BE IDENTIFIED BY DETECTABLE WARNING TAPE, MINIMUM 2 INCHES WIDE, WITH LETTERING TO IDENTIFY BURIED LINE BELOW.
3. 2012 NC FUEL GAS CODE, SECTION 404.15.3 TRACER: AN INSULATED COPPER TRACER WIRE OR OTHER APPROVED CONDUCTOR SHALL BE INSTALLED ADJACENT TO THE UNDERGROUND NONMETALLIC PIPING. ACCESS SHALL BE PROVIDED TO THE TRACER WIRE OR THE TRACER WIRE SHALL TERMINATE ABOVEGROUND AT THE END OF THE NONMETALLIC PIPING. THE TRACER WIRE SIZE SHALL NOT BE LESS THAN 18AWG AND THE INSULATION TYPE SUITABLE FOR DIRECT BURIAL.

Know what's below. Call before you dig.

20' 0 20' 40'
SCALE: 1"=20' (Horiz.)

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportattion, Raleigh, NC SCO # 141126301A

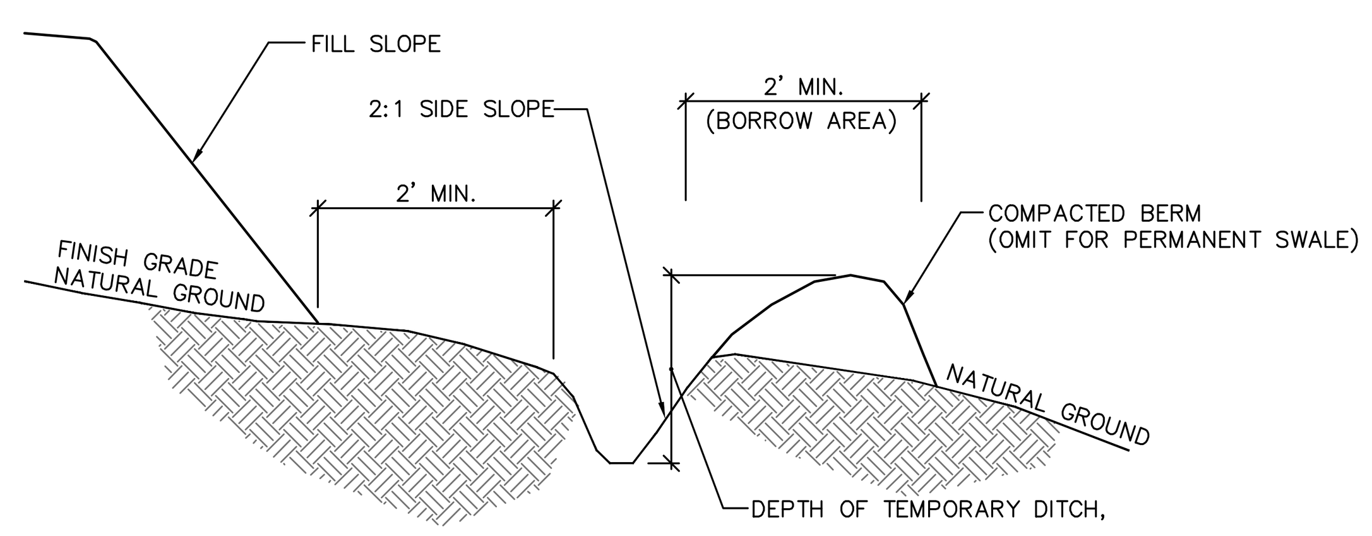
architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

NORTH CAROLINA PROFESSIONAL SEAL 31498 ENGINEER DOUGLAS K. DRAFTEN 10/18/16

McKIM&CREED
370 N. Louisiana Ave.
Suite F-3
Asheville, NC 28806
828/252-8181 Voice
828/252-8857 Fax
NC License No. F-1222

Designed Drawn
Checked Date 10/18/16
Project No. 07002-0002

C1.0



NOTE:

1. DITCH SHOULD HAVE MINIMUM LONGITUDINAL SLOPE OF 1.0%.
2. SILT FENCE MAY BE REQUIRED BEHIND BERM.

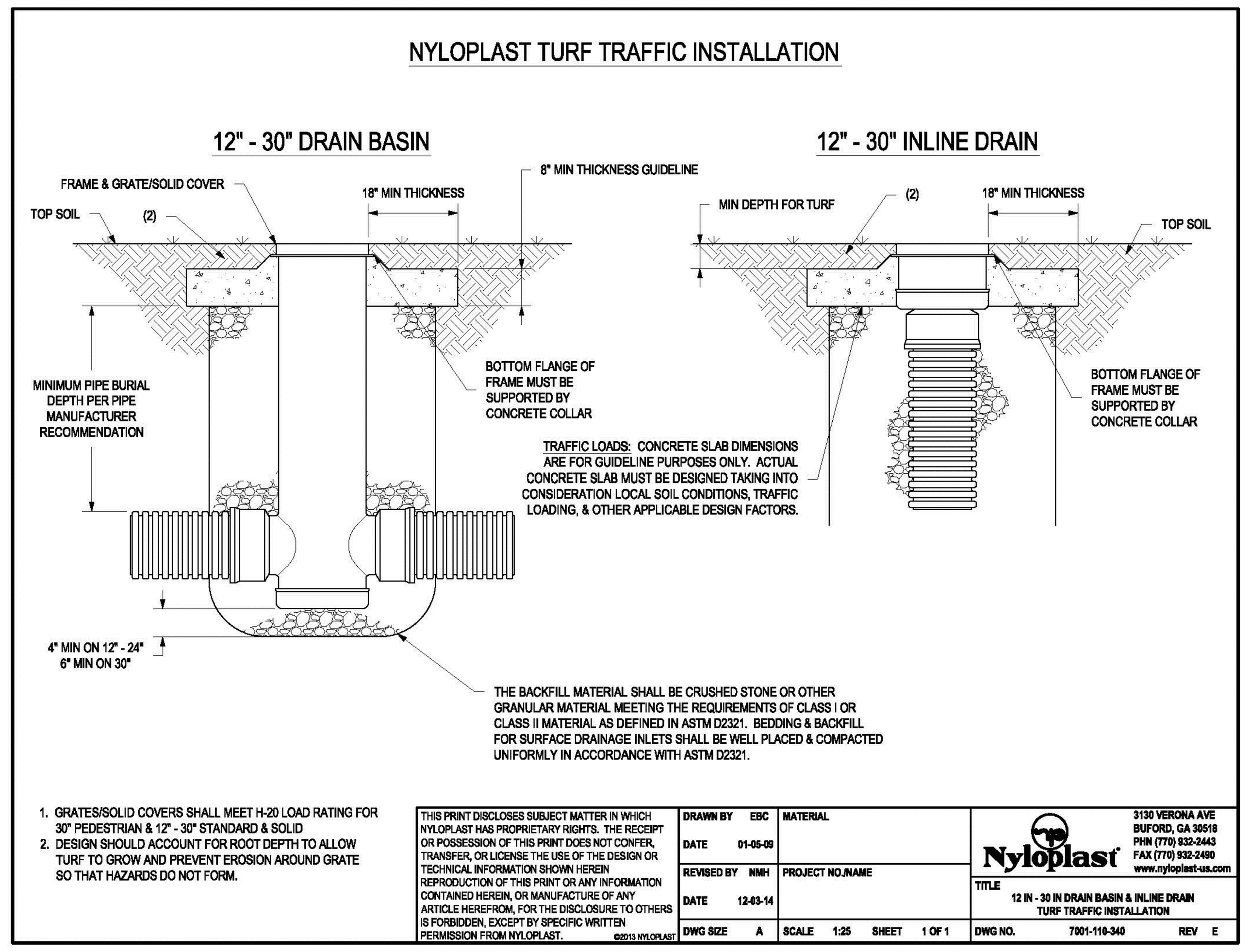
TEMPORARY DITCH MAINTENANCE NOTE:

INSPECT TEMPORARY DIVERSIONS ONCE A WEEK AND AFTER EVERY RAINFALL. IMMEDIATELY REMOVE SEDIMENT FROM THE FLOW AREA AND REPAIR THE DIVERSION RIDGE. CAREFULLY CHECK OUTLETS AND MAKE TIMELY REPAIRS AS NEEDED. WHEN THE AREA PROTECTED IS PERMANENTLY STABILIZED, REMOVE THE RIDGE AND THE CHANNEL TO BLEND WITH THE NATURAL GROUND LEVEL AND APNEWRIATELY STABILIZE IT.

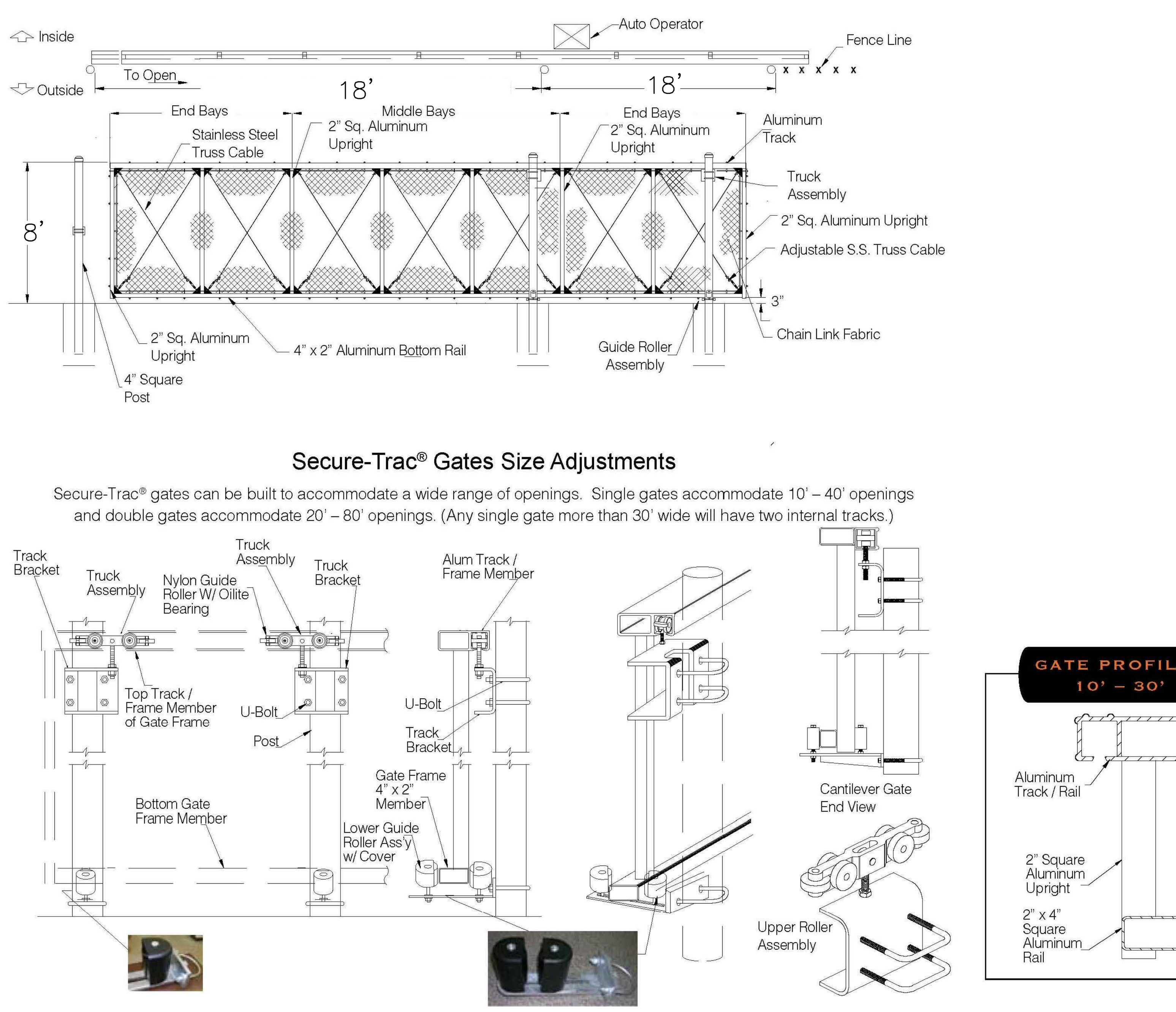
PERMANENT DITCH MAINTENANCE NOTE:

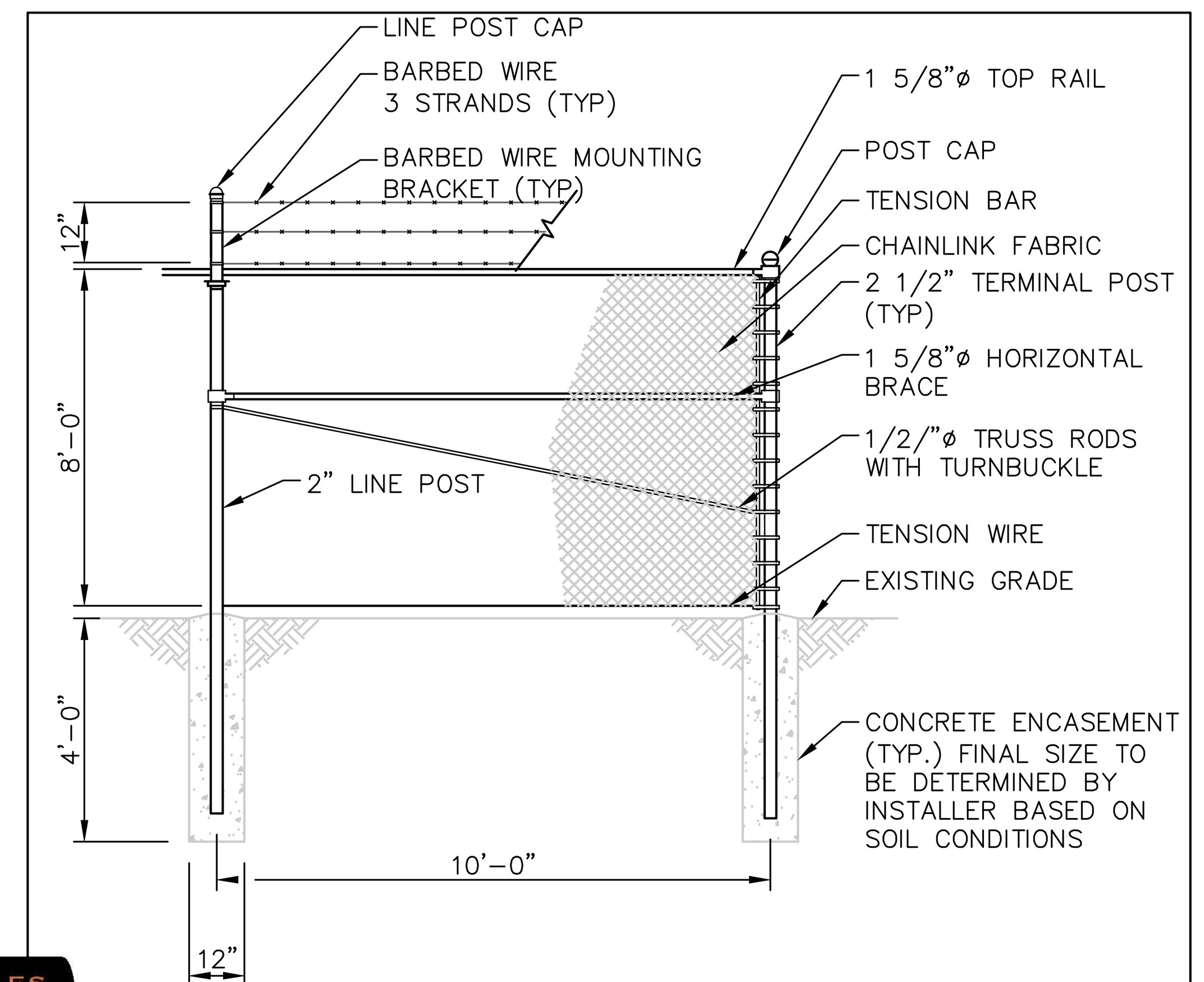
INSPECT PERMANENT DIVERSIONS AFTER EVERY RAINFALL DURING THE CONSTRUCTION OPERATION. IMMEDIATELY REMOVE ANY OBSTRUCTIONS FROM THE FLOW AREA, AND REPAIR THE DIVERSION RIDGE. CHECK OUTLETS, AND MAKE TIMELY REPAIRS AS NEEDED. MAINTAIN THE VEGETATION IN A VIGOROUS, HEALTHY CONDITION AT ALL TIMES.

TEMPORARY DIVERSION & PERMANENT DITCH N.T.S. (1)



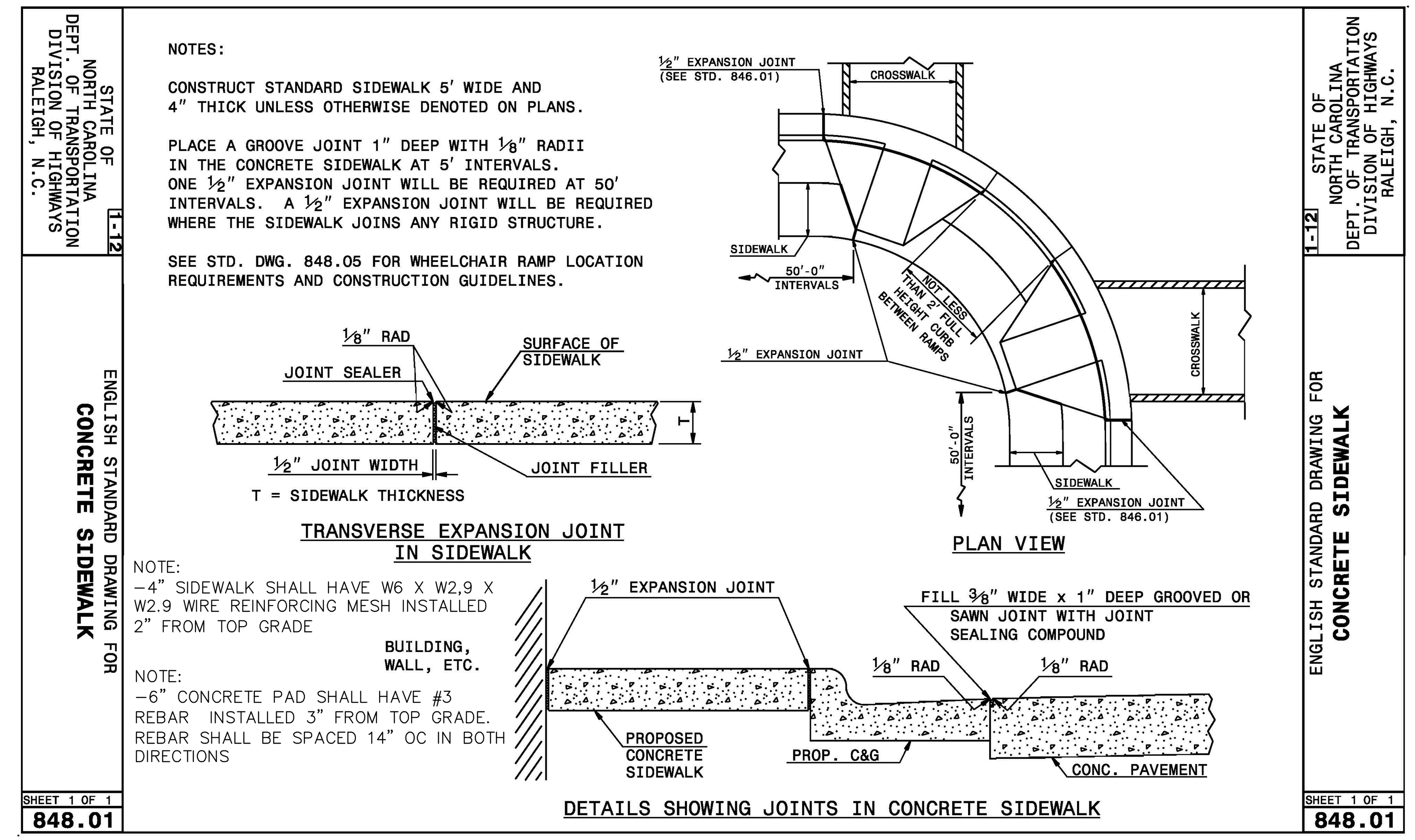
ADS DRAIN DETAIL N.T.S. (2)



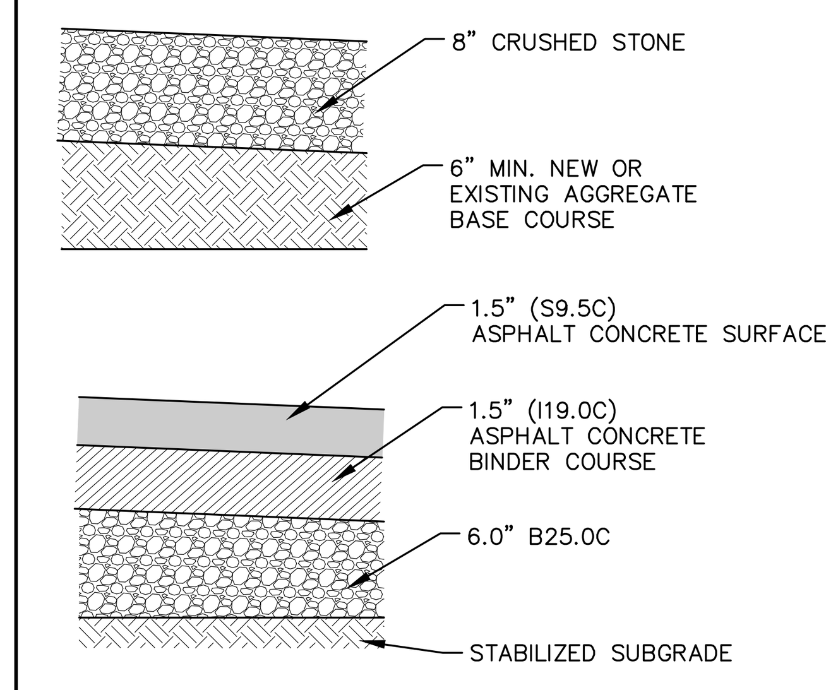


NOTE:
- 2" MESH FABRIC SHALL BE 1.2 OZ. GALVANIZED.
- ALL POSTS SHALL BE SCHEDULE 40 GALVANIZED PIPE.
- 3 STRANDS OF BARB WIRE TO BE INSTALLED AT TOP OF FENCE
- GATES TO BE REMOTE CONTROLLED AND MOTORIZED PER OWNER SUPPLIED CONTROLS. CONTRACTOR TO COORDINATION INSTALLATION

CHAIN LINK FENCE DETAIL N.T.S. (3)

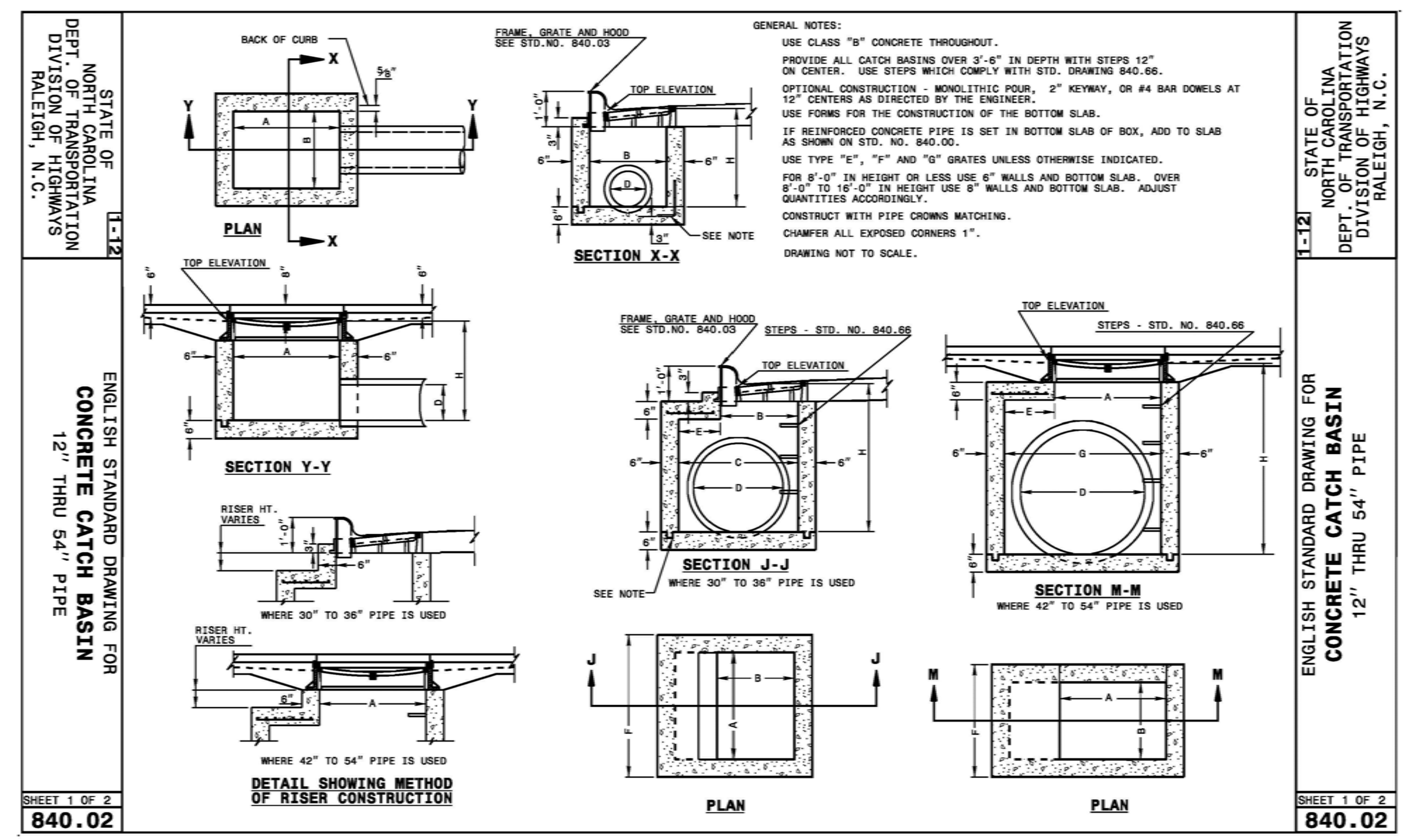


CONCRETE SIDEWALK DETAIL CONCRETE SIDEWALK DETAIL N.T.S. (4)

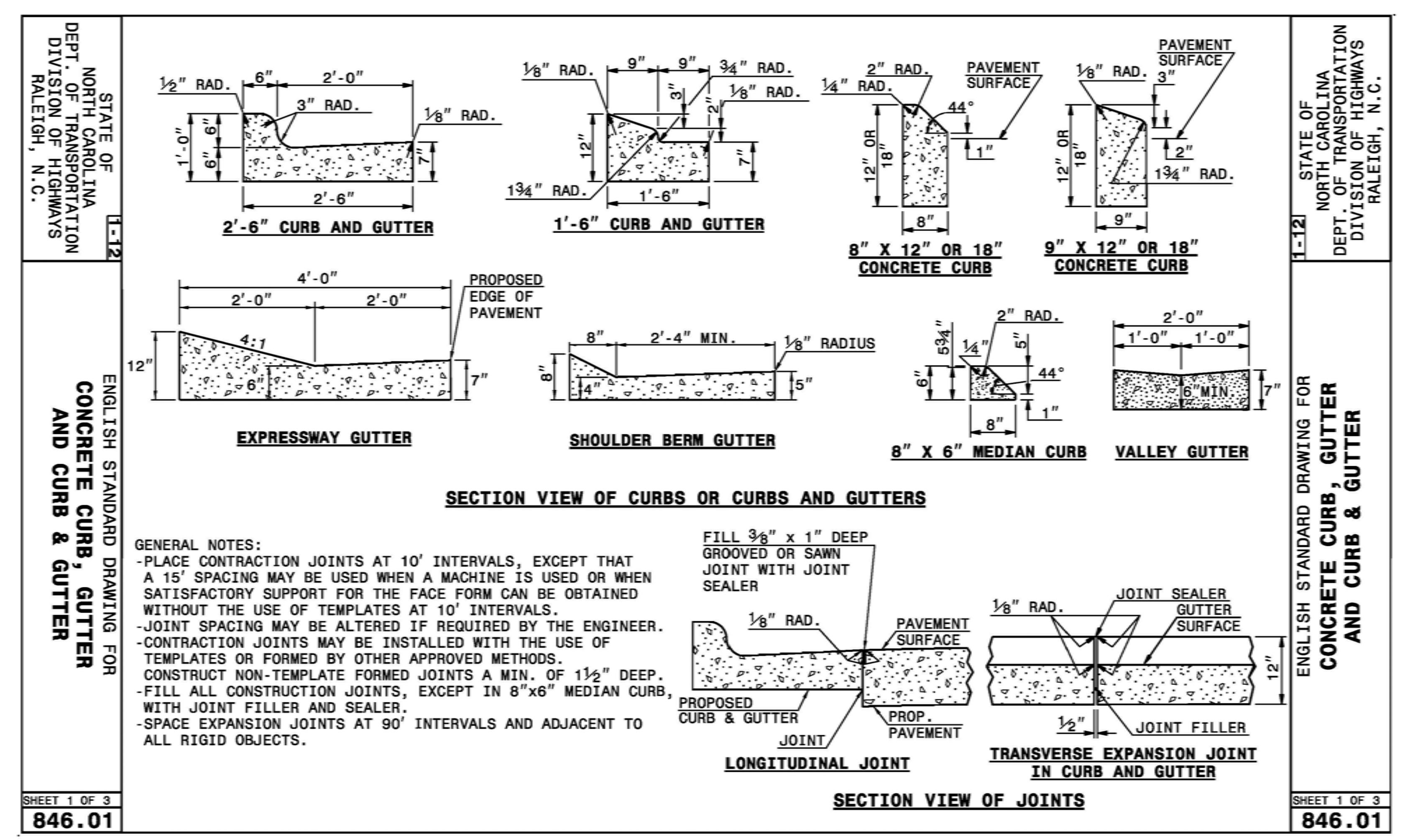


NOTE: GC TO CONSULT WITH GEOTECH OR PAVEMENT DESIGNER FOR FINAL PAVEMENT DESIGN

PAVEMENT SECTIONS N.T.S. (7)



CONCRETE CATCH BASIN N.T.S. (5)



CONCRETE CURB DETAIL N.T.S. (6)

811 Know what's below. Call before you dig.

Division 13 Maintenance/Bridge Maintenance Assembly Office

Department. of Transportation, Raleigh, NC SCO # 141126301A

NORTH CAROLINA PROFESSIONAL SEAL 31496 ENGINEER DOUGLAS K. DRAFFEN

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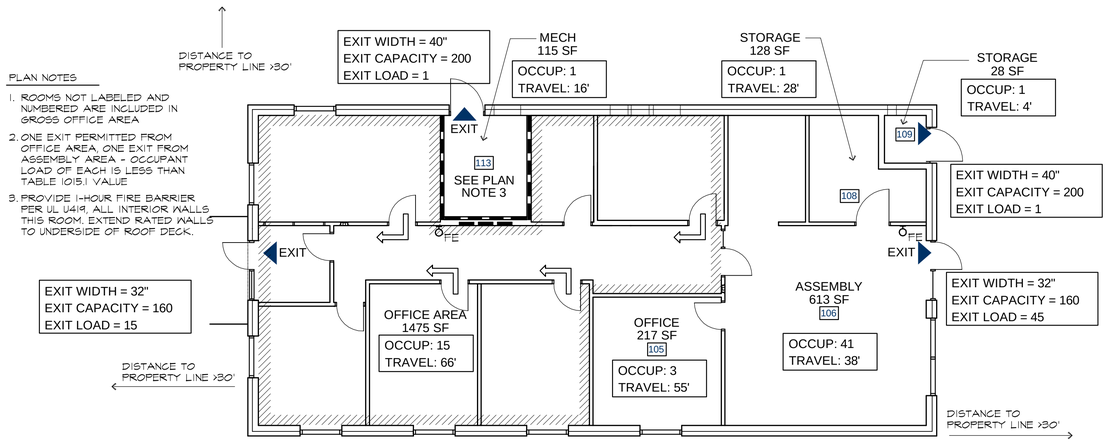
828/252-8857 Fax
NC License No. F-1222
Designed Drawn
Checked Date 10/18/16
Project No. 07002-0002

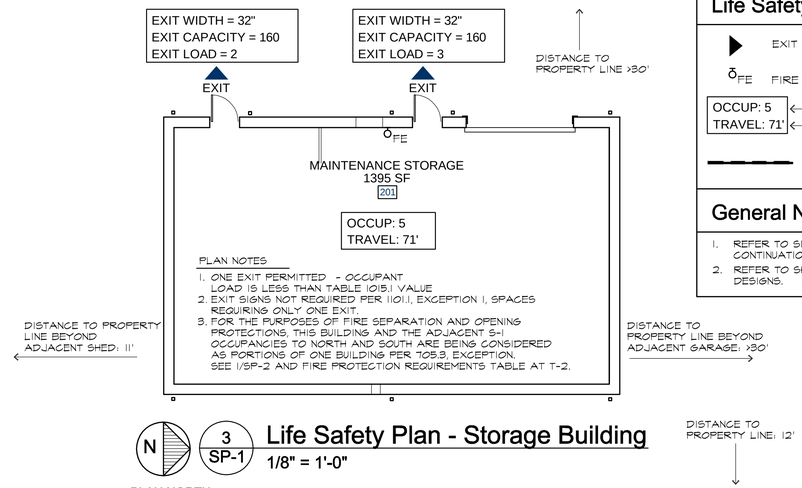
architectural design studio
70 Wall Street, Asheville, NC 28801 ml@ads-architects.com Ph: 828.252.0355

10/18/16



Life Safety Plan - Office/Assembly Building

1/8" = 1'-0"



Life Safety Plan - Storage Building

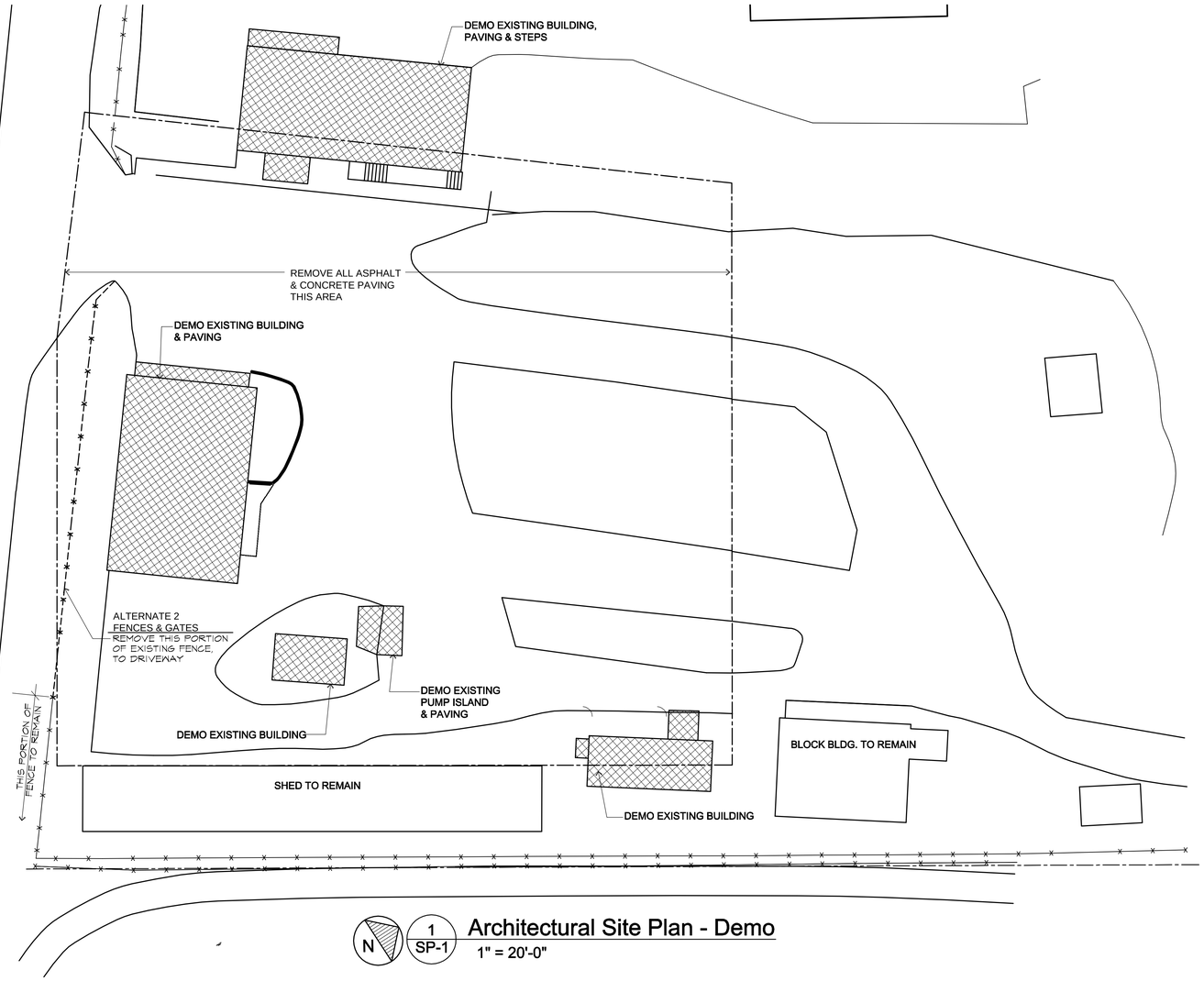
1/8" = 1'-0"

Life Safety Plan Legend

- EXIT
- FE FIRE EXTINGUISHER
- OCCUP: 5 ← OCCUPANT LOAD
- TRAVEL: 71' ← MAX. TRAVEL DISTANCE
- 1 HOUR RATED FIRE BARRIER WALL

General Notes

1. REFER TO SITE PLAN, 1/SP-2, FOR CONTINUATION OF EGRESS PATHS.
2. REFER TO SHEET T-3 FOR UL ASSEMBLY DESIGNS.



Architectural Site Plan - Demo

1" = 20'-0"

Architectural
Site Demo Plan,
Life Safety Plans

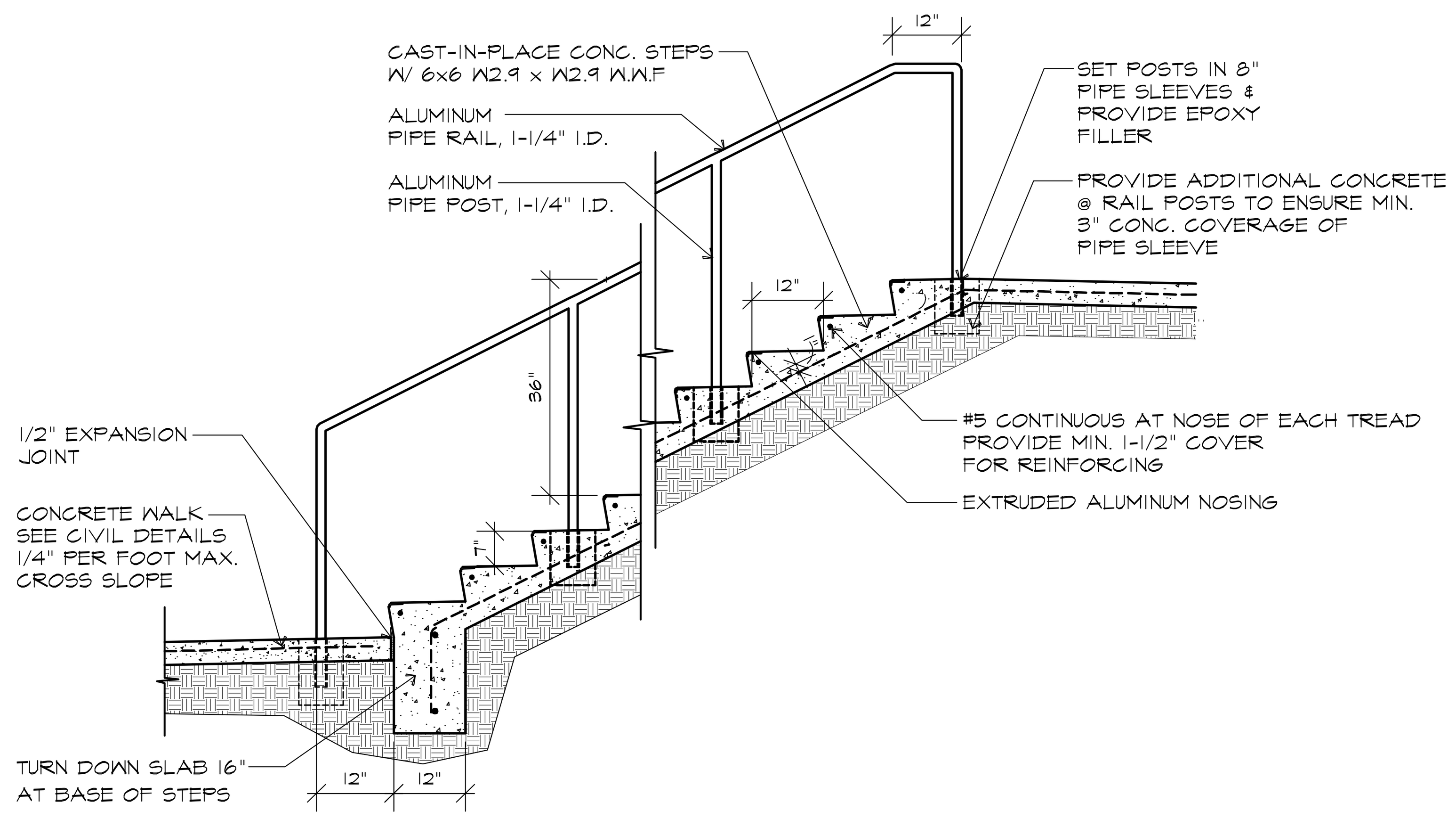
MIKE COX
REGISTERED ARCHITECT
6853
10/18/16
NORTH CAROLINA
ASHEVILLE N.C.

ARCHITECTURAL DESIGN STUDIO
CERT.NO
50382
ASHEVILLE NC PA

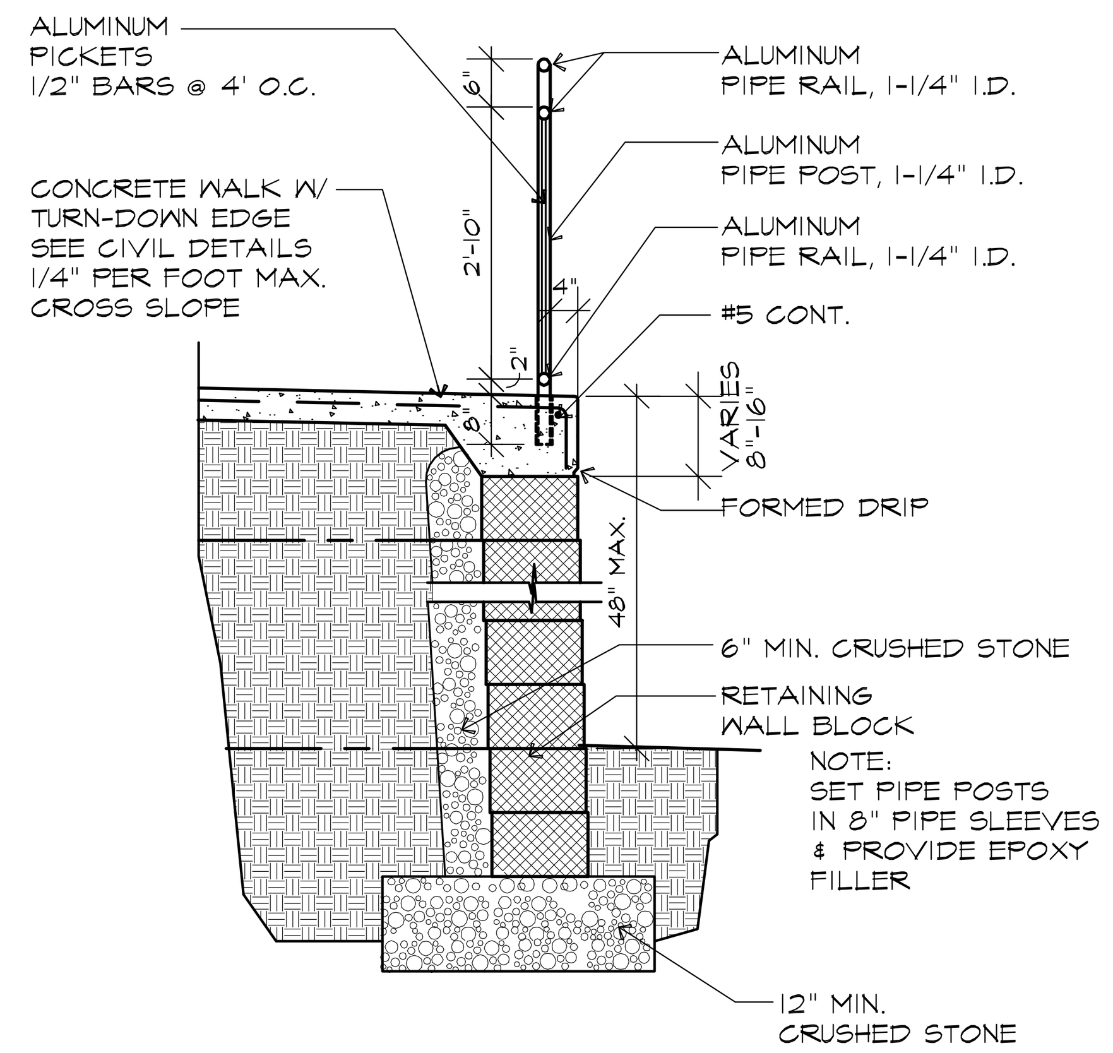
architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

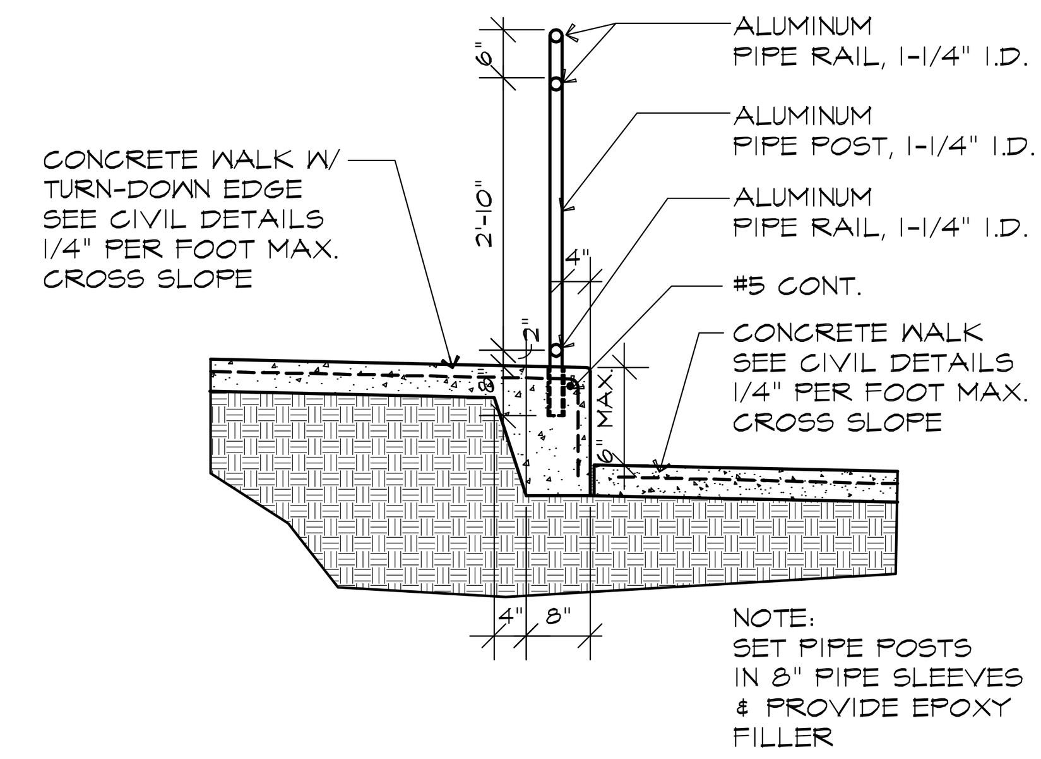
SP-1



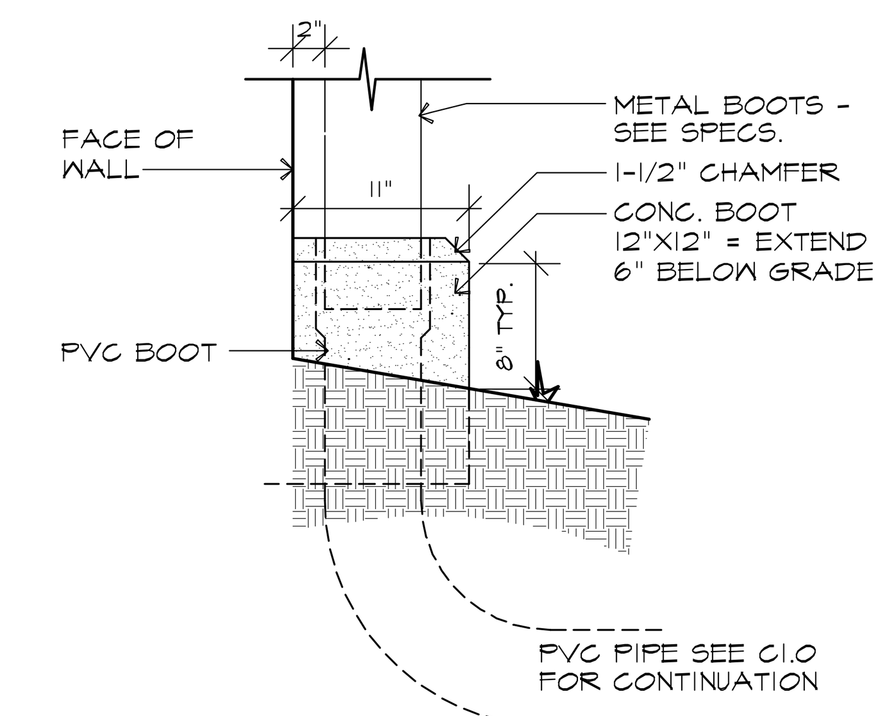
2 SP-2 **Typical Steps & Rails**
1/2" = 1'-0"



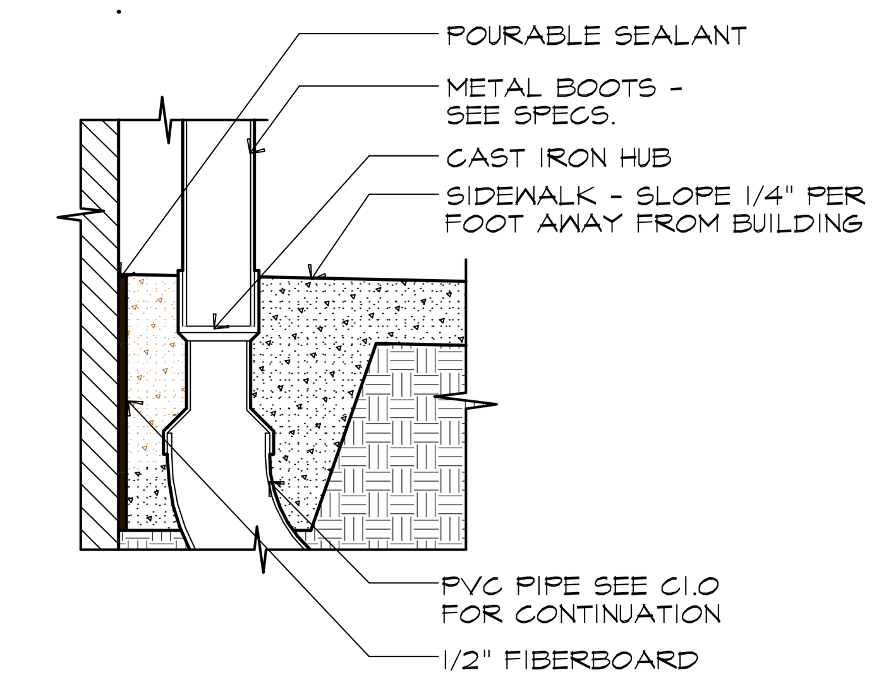
3 SP-2 **Segmented Block Wall**
1/2" = 1'-0"



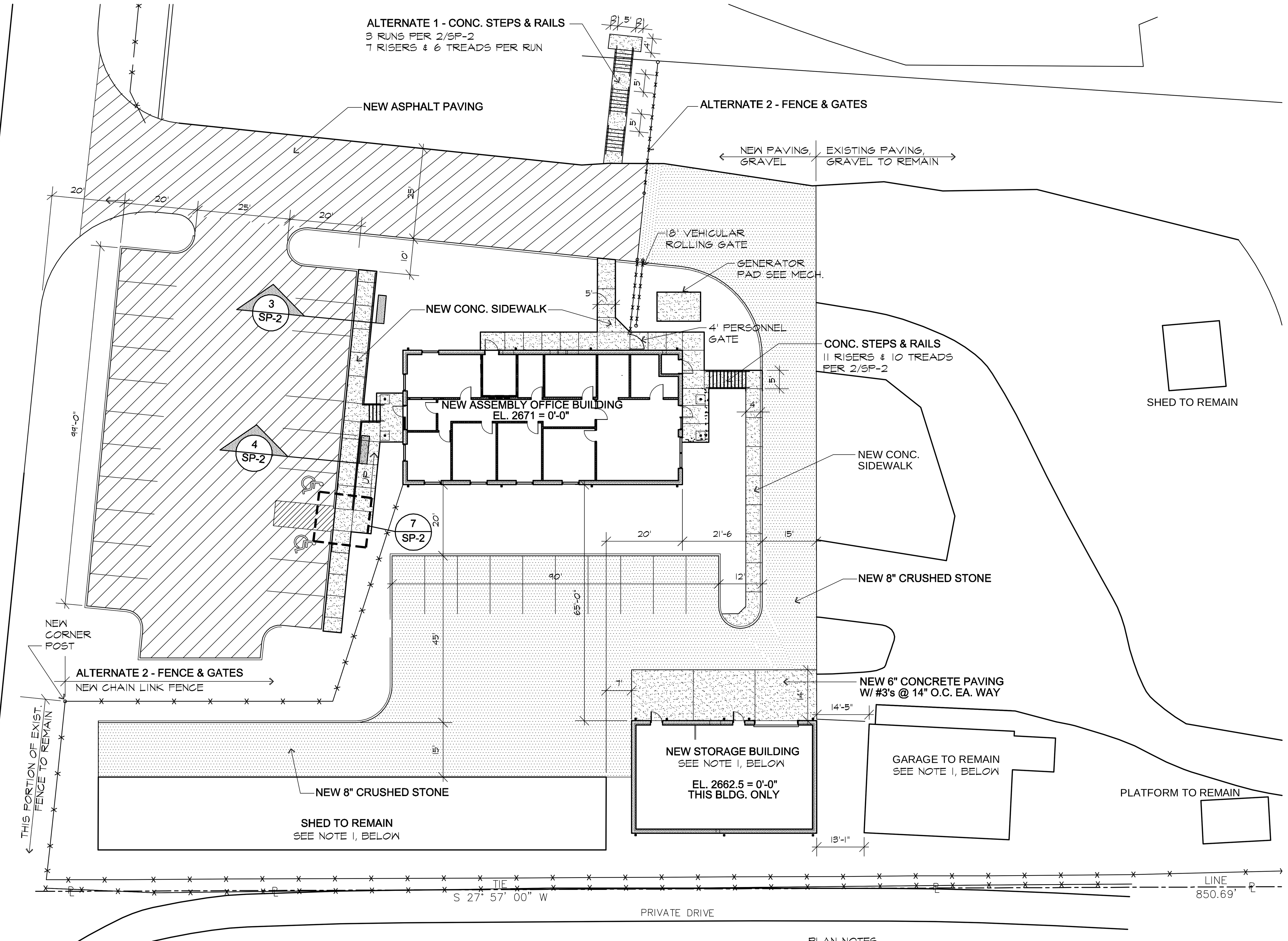
4 SP-2 **Sloped Walk Detail**
1/2" = 1'-0"



5 SP-2 **Conc. Boot Detail**
N.T.S.



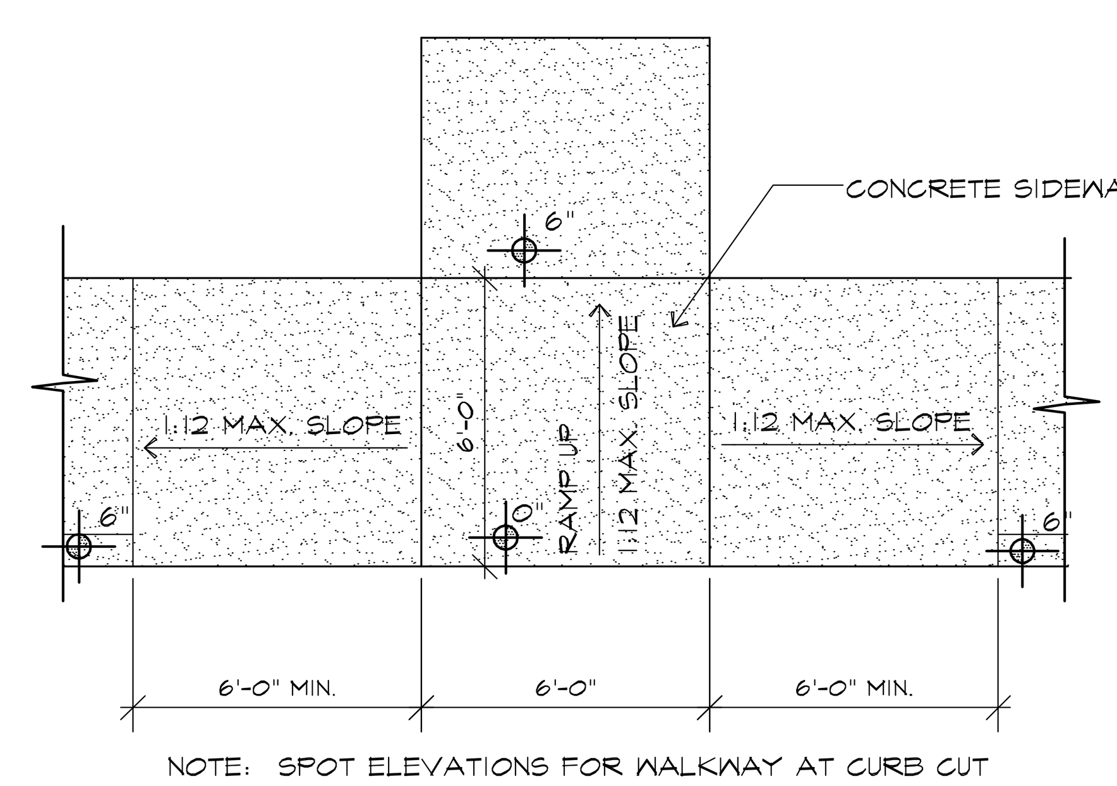
6 SP-2 **Conc. Boot Detail @ Sidewalks**
N.T.S.



N 1 SP-2 **Architectural Site Plan - New**
1" = 20'-0"

PLAN NOTES

1. FOR THE PURPOSES OF FIRE SEPARATION AND OPENING PROTECTIONS, THIS BUILDING AND THE ADJACENT S-1 OCCUPANCIES TO NORTH AND SOUTH ARE BEING CONSIDERED AS PORTIONS OF ONE BUILDING PER 705.3, EXCEPTION. SEE FIRE PROTECTION REQUIREMENTS TABLE AT T-2.



7 SP-2 **H.C. Curb Cut @ Sidewalk**
1/4" = 1'-0"

Architectural Site Plan, Site Details

Division 13 Maintenance/Bridge Maintenance Assembly Office

Department. of Transportation, Raleigh, NC SCO # 141126301A

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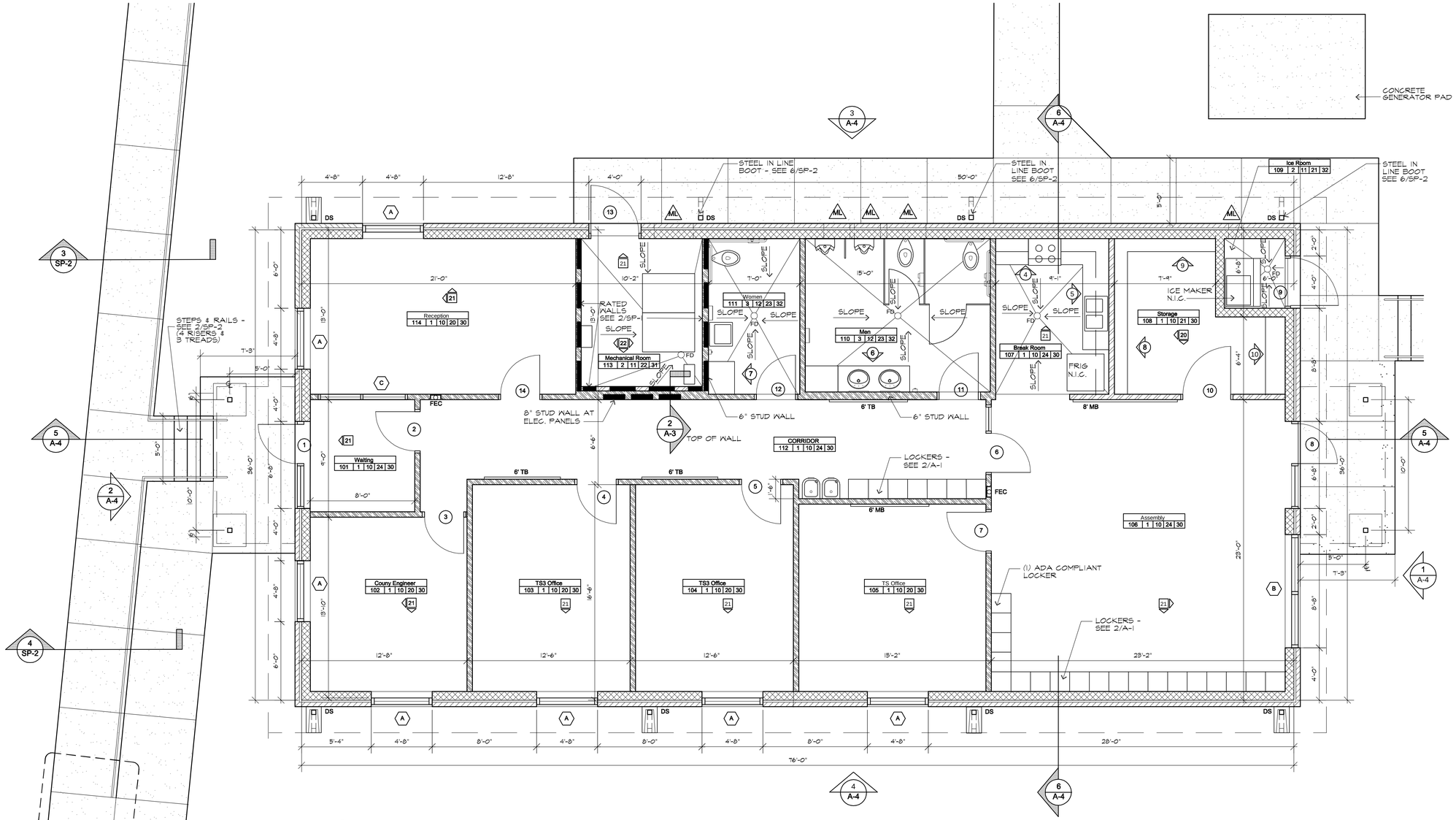
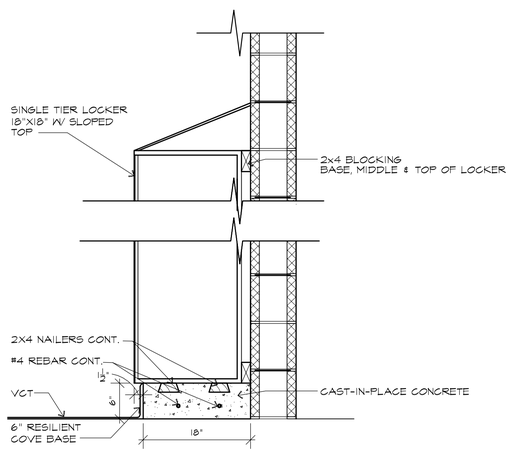
MIKE COX 6653 10/18/16 ASHEVILLE, N.C.
ARCHITECTURAL DESIGN STUDIO PA CERT. NO 50382 ASHEVILLE, NC



Floor Plan - Office/Assembly Building

1/4" = 1'-0"

PLAN NORTH



Locker Base Detail

N.T.S.

Room Finish Schedule

	#	FINISH
Floor	1	VCT
	2	Troweled, Sealed Concrete
	3	Porcelain Tile
	4	
Base	10	6" Resilient Base
	11	None
	12	Porcelain Tile
	13	4" Resilient Base
Walls	20	Paint on Gypsum Bd.
	21	Paint on Concrete Block
	22	Paint on Fire Rated Gyp. Bd.
	23	Porcelain Tile to Finish Ceiling
	24	Paint on Abuse Resistant Gyp. Bd.
Ceiling	30	Acoustical Tile
	31	Paint on Gypsum Bd.
	32	Paint on Moisture Resistant Gypsum Bd.
	33	Exposed Structure
	34	

Symbols Legend

- SECTION#/SHEET LOCATION
- ELEVATION#/SHEET LOCATION
- DETAIL#/SHEET LOCATION
- ELEVATION REFERENCE

Floor Plan Legend

- Mtl. Studs w/ Gyp. Bd.- See Finish Schedule for Type
- Mtl. Studs & Acoustic Batt Insul. w/ Gyp. Bd. - See Finish Schedule
- Concrete Block
- Brick Veneer
- Concrete Walk
- Media Center 201 | 1 | 10 | 20 | 30 — Room Finish Tag: See Finish Schedule This Sheet. (Ceiling, Walls, Base, Floor)
- 2 — Finish Number Where Different from General Room Finish Designation
- 3 — Door Number, See Schedule Sheet A-6
- 6 — Window Type, See Schedule Sheet A-6
- MB, TB — Display Boards - See Specs for Type, Bottom @ 34" A.F.F.
- DS — Downspout -See 5/SP-2
- FD — Floor Drain - See Plumbing
- ML — Mechnical Louver or Fan, Refer to Mechanical Drawings
- 1 — Casework Elevation See Sheet A-7
- FEC — Fire Extinguisher Cabinet
- FE — Fire Extinguisher

Plan Notes

1. DIMENSIONS ARE TO FACE OF STUDS OR FACE OF CMU U.O.N.
2. RESILIENT BASE SHALL BE 6" HIGH TYP, 4" HIGH AT CASEWORK WITH TOES.

Office/Assembly Building
Floor Plan & Details

10/18/16

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

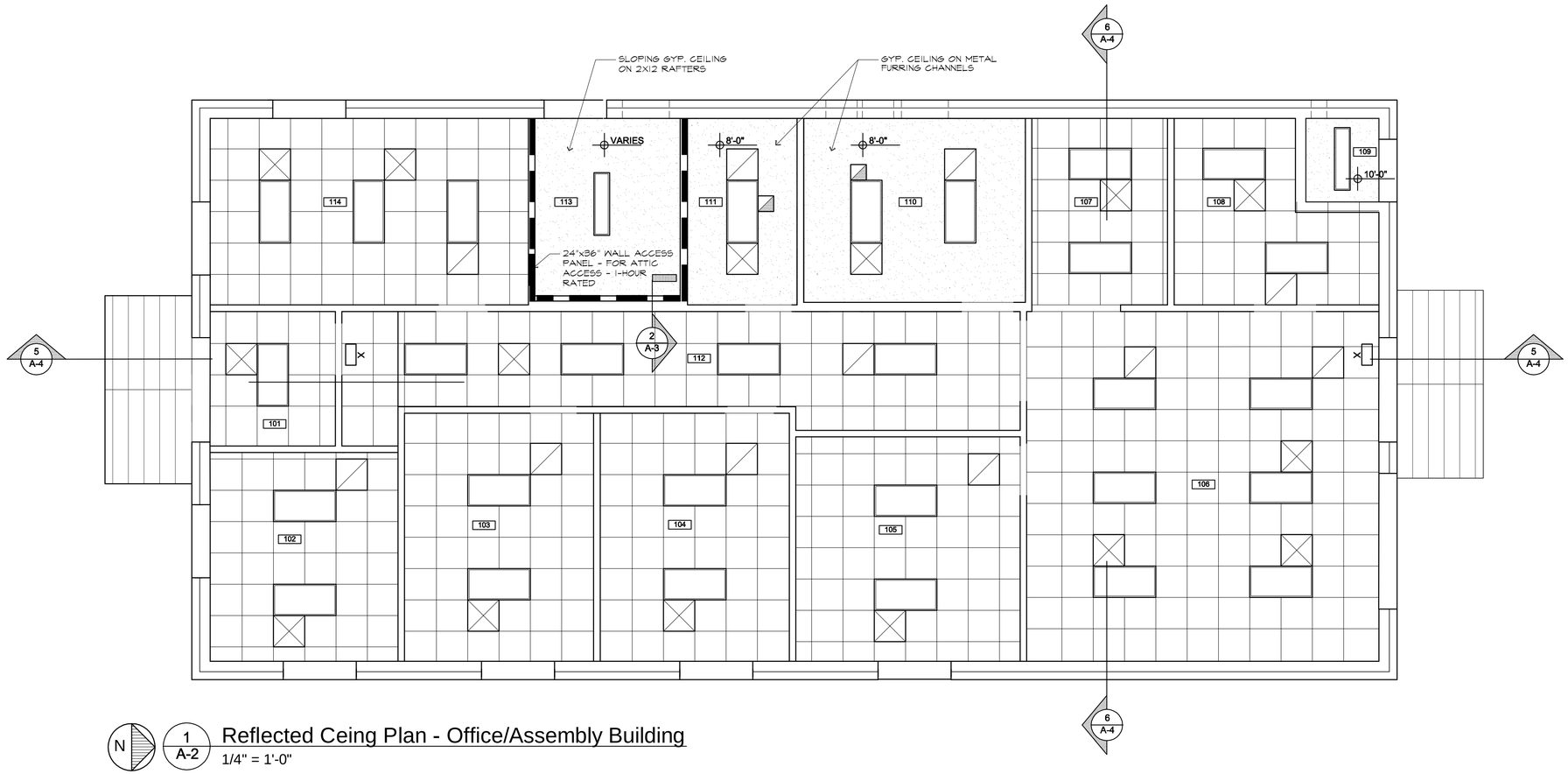
architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

MIKE COX REGISTERED ARCHITECT 26537 10/18/16 NORTH CAROLINA ASHEVILLE N.C.

ARCHITECTURAL DESIGN STUDIO CERT.NO 50382 ASHEVILLE, NC PA

A-1

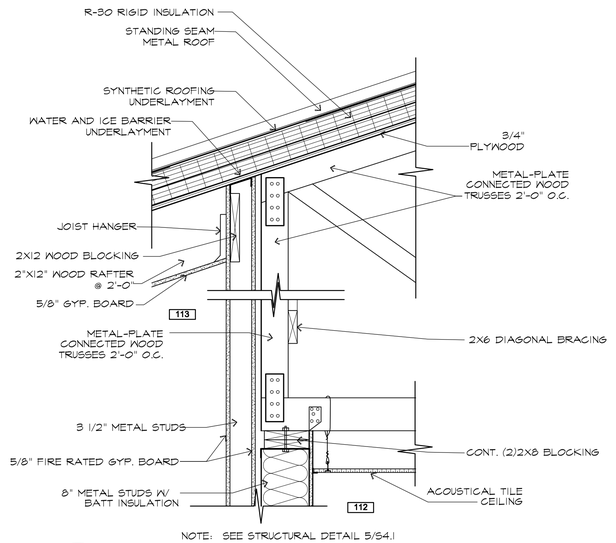
10/18/16



N — 1 / A-2 — PLAN NORTH

Reflected Ceing Plan - Office/Assembly Building

1/4" = 1'-0"



NOTE: SEE STRUCTURAL DETAIL S/S4.1

2 / A-2 — Ceiling Detail @ Mechanical Room

1" = 1'-0"

Symbols Legend

- SECTION#/SHEET LOCATION
- ELEVATION#/SHEET LOCATION
- DETAIL#/SHEET LOCATION
- ELEVATION REFERENCE

Ceiling Plan Legend

- 2'x2' ACT
- Gypsum Board Ceiling -See Finish Schedule for Type
- Unit Heater (See Mech)
- Exhaust Fan (See Mech)
- Light Fixtures (See Elec)
- X — Exit Light (See Elec)
- WALL ACCESS PANEL

Plan Notes

1. CEILING HEIGHT IS 9'-4" A.F.F. U.O.N.
2. COORDINATE CEILING TILES, GRIDS, DIFFUSERS WITH WOOD JOISTS ABOVE.

Division 13 Maintenance/Bridge Maintenance Assembly Office

Department. of Transportattion, Raleigh, NC SCO # 141126301A

Office/Assembly Building
Reflected Ceiling Plan

architectural design studio
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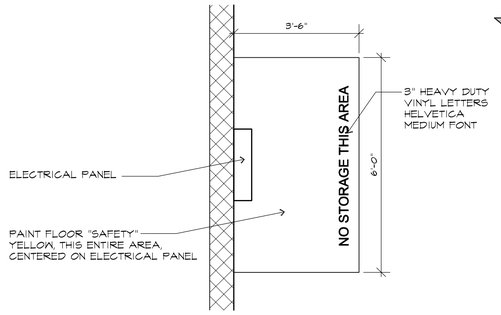
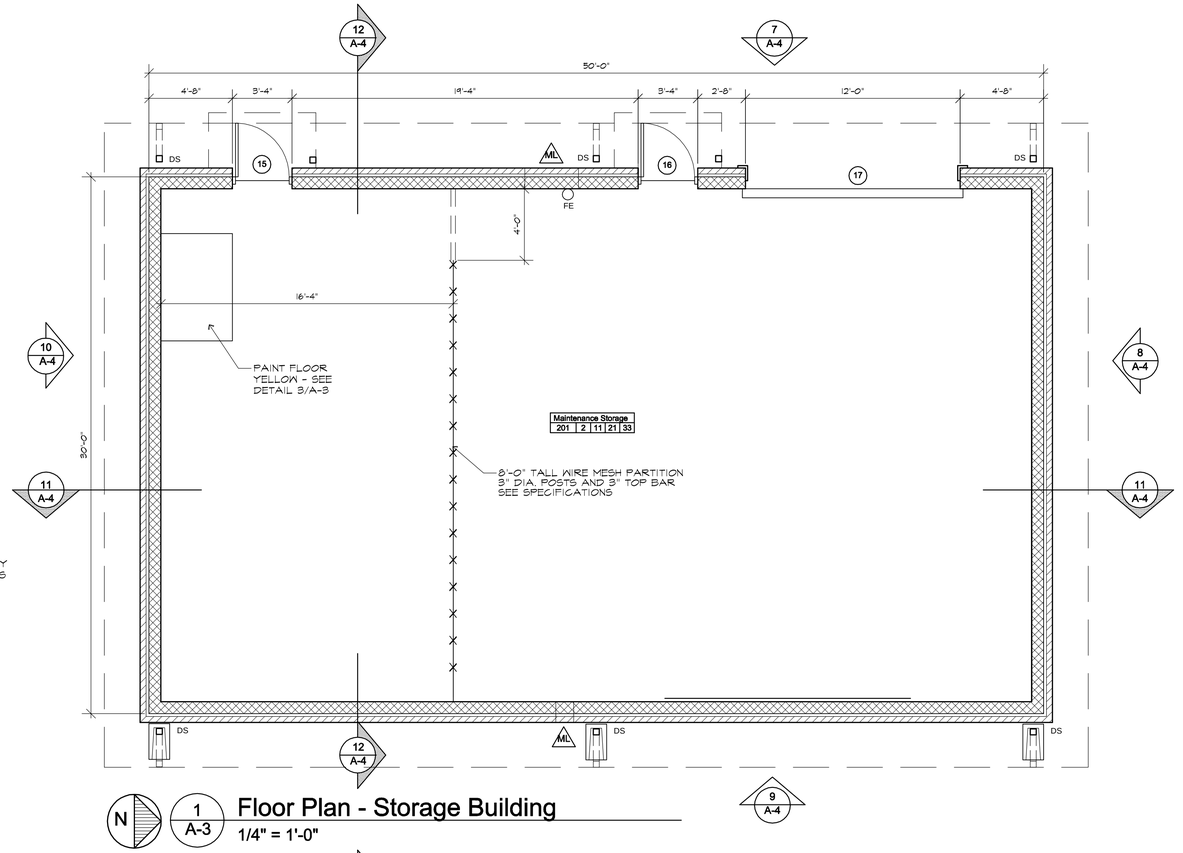
MIKE COX REGISTERED ARCHITECT 26537 10/18/16 NORTH CAROLINA ASHEVILLE, N.C.

ARCHITECTURAL DESIGN STUDIO, PA CERT.NO 50382 ASHEVILLE, NC

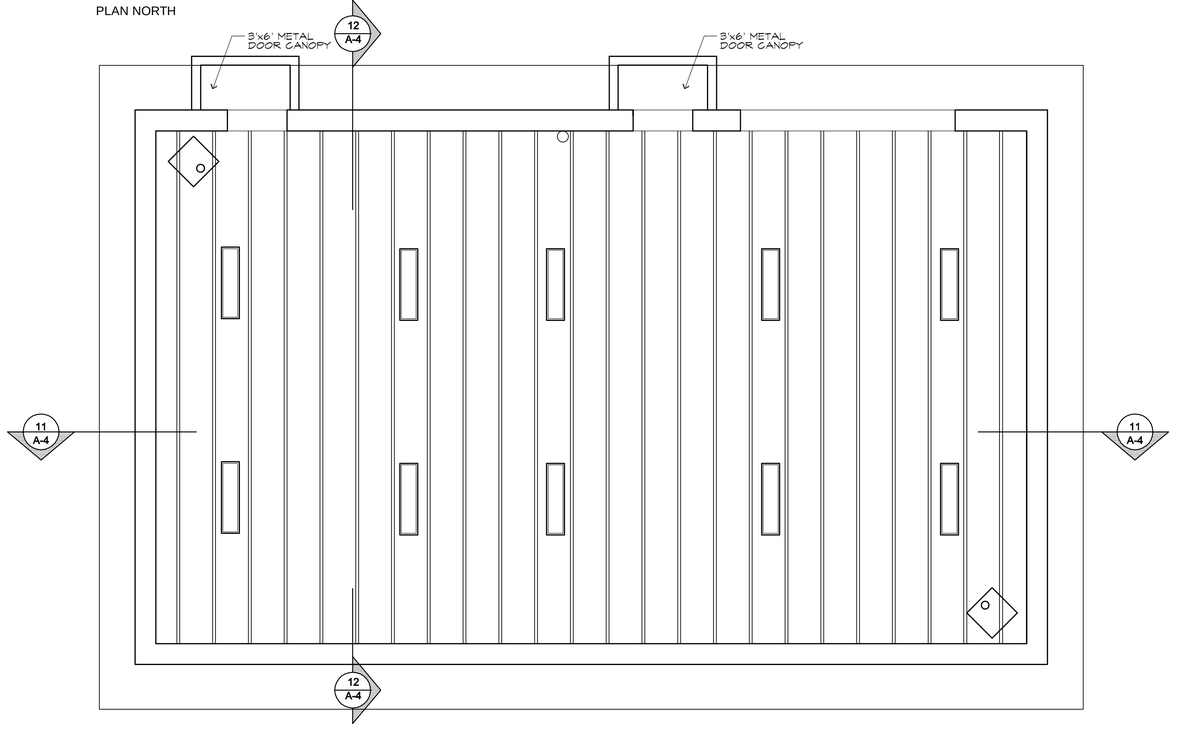
A-2



3 / A-3 **Clear Area Detail**
1/2" = 1'-0"



N / 1 / A-3 **Floor Plan - Storage Building**
1/4" = 1'-0"
PLAN NORTH



N / 2 / A-3 **Reflected Ceiling Plan - Storage Building**
1/4" = 1'-0"
PLAN NORTH

Room Finish Schedule

	#	FINISH
Floor	1	VCT
	2	Troweled, Sealed Concrete
	3	Porcelain Tile
	4	
Base	10	6" Resilient Base
	11	None
	12	Porcelain Tile
	13	4" Resilient Base
Walls	20	Paint on Gypsum Bd.
	21	Paint on Concrete Block
	22	Paint on Water Resistant Gyp. Bd.
	23	Porcelain Tile to Finish Ceiling
Ceiling	30	Acoustical Tile
	31	Paint on Gypsum Bd.
	32	Paint on Moisture Resistant Gypsum Bd.
	33	Exposed Structure
	34	

Symbols Legend

- SECTION#/SHEET LOCATION
- ELEVATION#/SHEET LOCATION
- DETAIL#/SHEET LOCATION
- ELEVATION REFERENCE

Floor Plan Legend

- Concrete Block
- Brick Veneer
- Concrete Walk
- Media Center 201 | 1 | 10 | 20 | 30 — Room Finish Tag See Finish Schedule This Sheet. (Ceiling, Walls, Base, Floor)
- 2 — Finish Number Where Different from General Room Finish Designation
- 3 — Door Number, See Schedule Sheet A-6
- 6 — Window Type, See Schedule Sheet A-6
- DS — Downspout
- FD — Floor Drain - See Plumbing
- ML — Mechanical Louver or Fan Refer to Mecanical Drawings
- FEC — Fire Extinguisher Cabinet
- FE — Fire Extinguisher

Ceiling Plan Legend

- Unit Heater (See Mech)
- Light Fixtures (See Elec)

10/18/16

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportattion, Raleigh, NC SCO # 141126301A

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m@ads-architects.com
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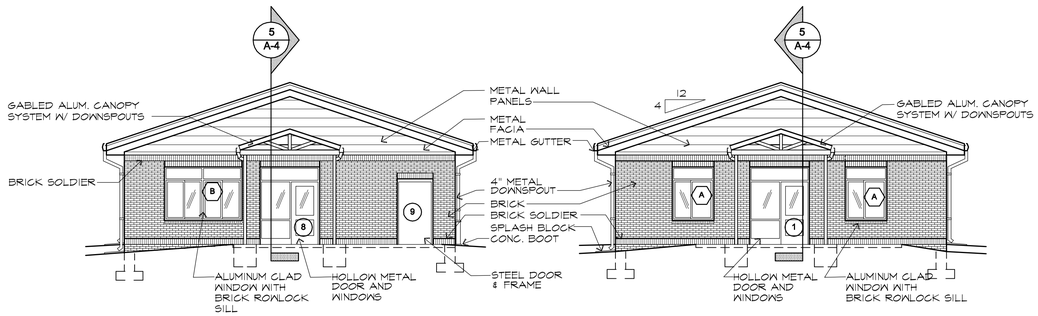
Storage Building
Floor Plan &
Reflected Ceiling Plan

MIKE COX REGISTERED ARCHITECT 12653 10/18/16 NORTH CAROLINA ASHEVILLE, N.C.

ARCHITECTURAL DESIGN STUDIO P.A. CERT.NO 50382 ASHEVILLE, NC

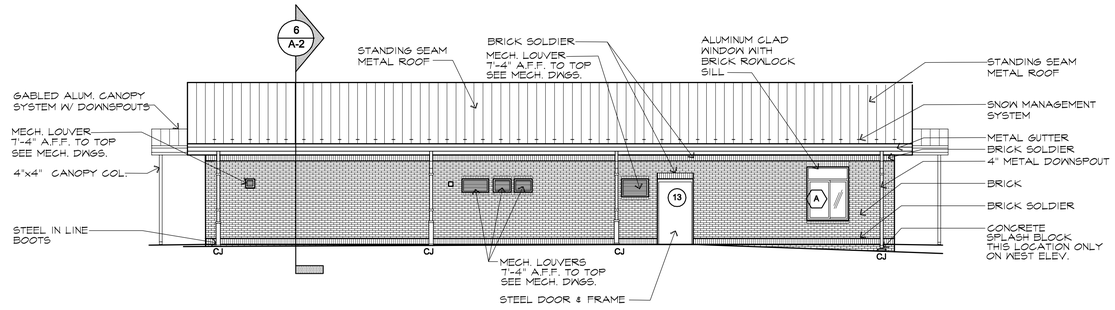
A-3

10/18/16

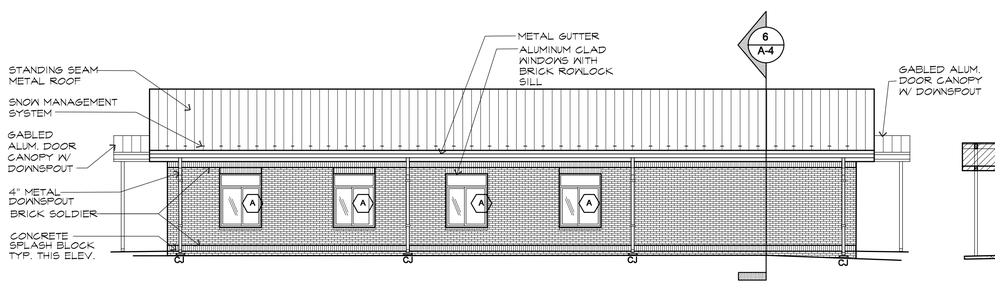


1 A-4 North Elevation - Office Assembly
1/8" = 1'-0"

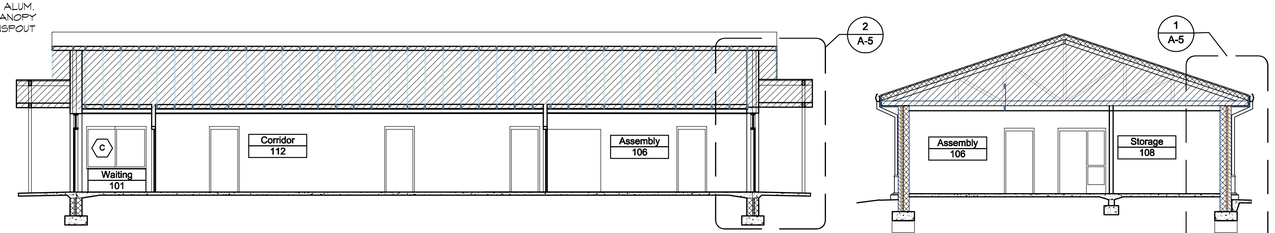
2 A-4 South Elevation - Office Assembly
1/8" = 1'-0"



3 A-4 West Elevation - Office Assembly
1/8" = 1'-0" NOTE: NO SPLASH BLOCKS THIS ELEVATION U.O.N.

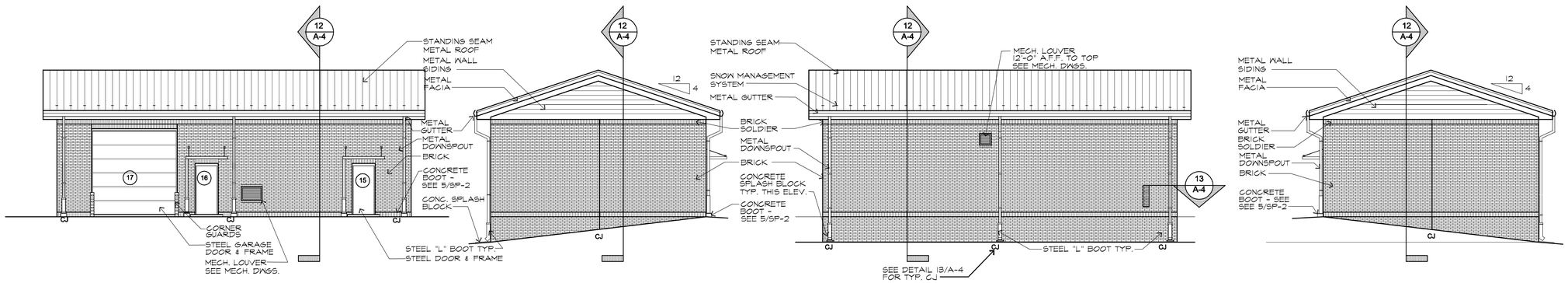


4 A-4 East Elevation - Office Assembly
1/8" = 1'-0"



5 A-4 Building Section - Office Assembly
1/8" = 1'-0"

6 A-4 Building Section - Office Assembly
1/8" = 1'-0"

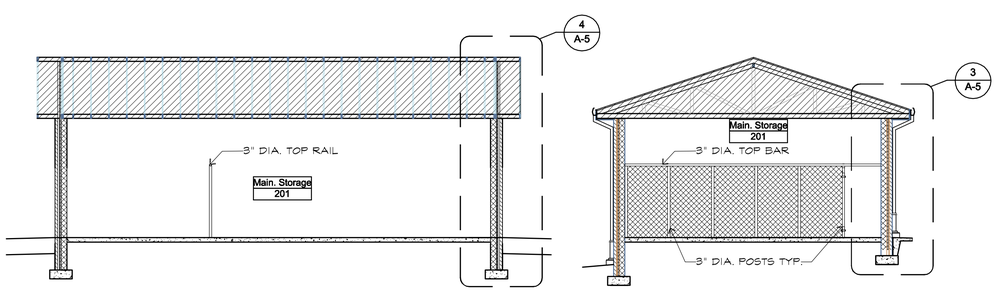


7 A-4 West Elevation - Storage Building
1/8" = 1'-0" NOTE: NO SPLASH BLOCKS THIS ELEVATION

8 A-4 North Elevation - Storage Building
1/8" = 1'-0"

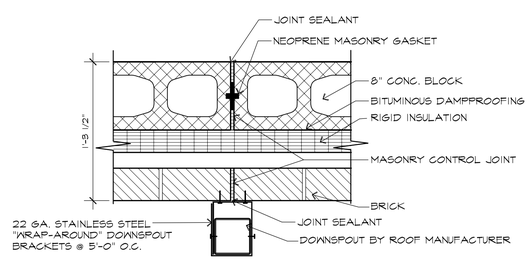
9 A-4 East Elevation - Storage Building
1/8" = 1'-0"

10 A-4 South Elevation - Storage Building
1/8" = 1'-0"



11 A-4 Building Section - Storage Building
1/8" = 1'-0"

12 A-4 Building Section - Storage Building
1/8" = 1'-0"



13 A-4 Typical CJ Detail
1-1/2" = 1'-0"

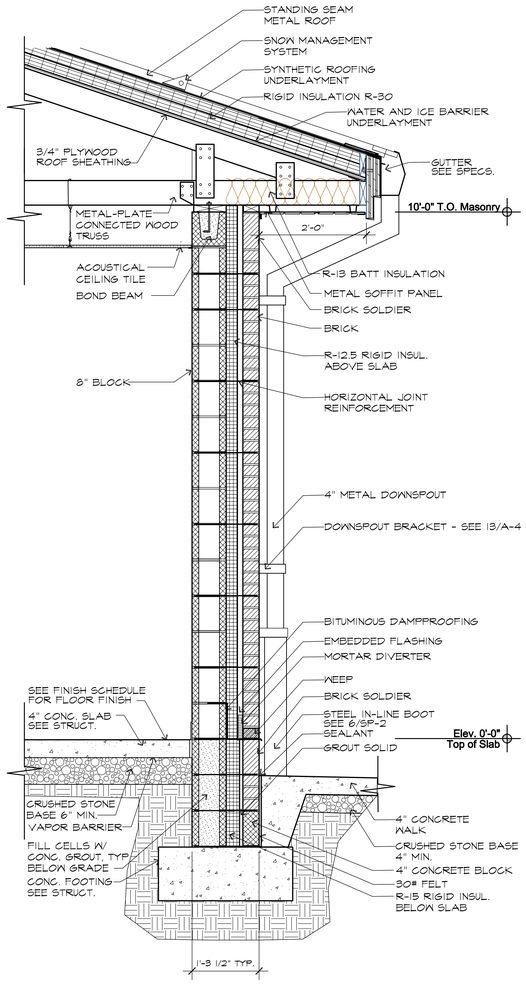
MIKE COX LICENSED ARCHITECT 6653 10/18/16 NORTH CAROLINA ASHEVILLE, N.C.

ARCHITECTURAL DESIGN STUDIO P.A. CERT.NO 50382 ASHEVILLE NC

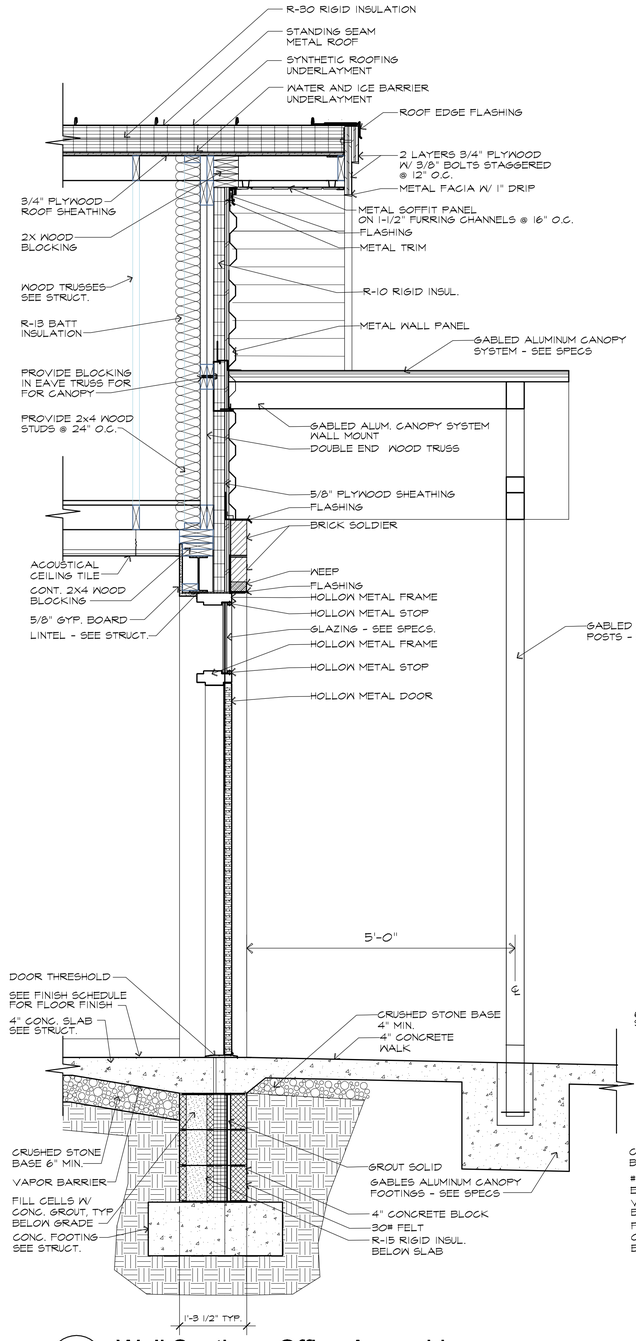
architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

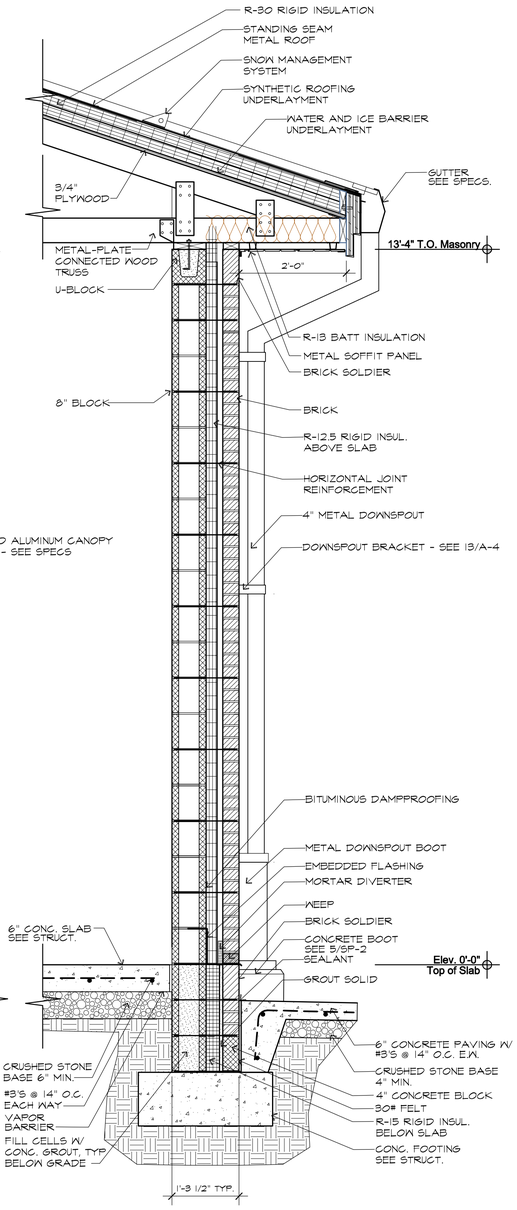
A-4



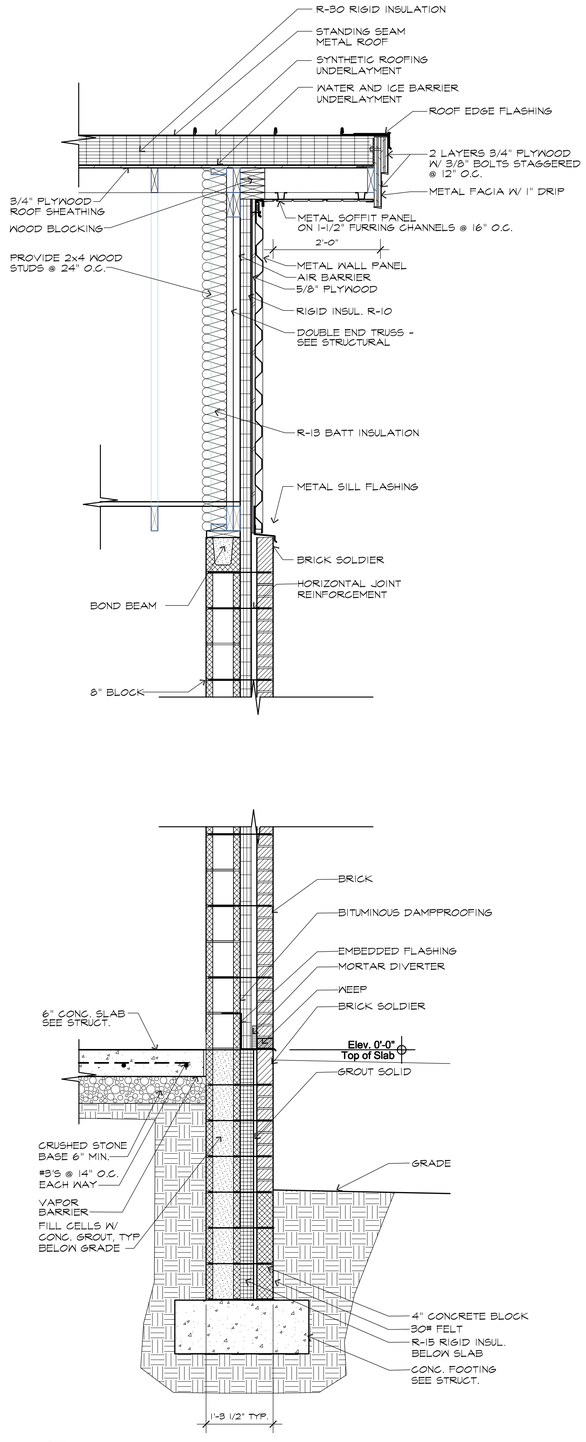
1 / A-5 **Wall Section - Office Assembly**
3/4" = 1'-0"



2 / A-5 **Wall Section - Office Assembly**
3/4" = 1'-0"



3 / A-5 **Wall Section - Storage Bldg.**
3/4" = 1'-0"



4 / A-5 **Wall Section - Storage Bldg.**
3/4" = 1'-0"

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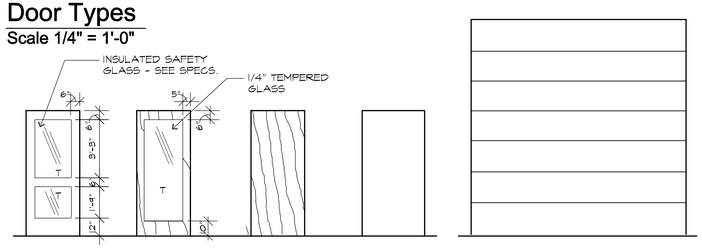
DUKE COX REGISTERED ARCHITECT 16537 10/18/16 NORTH CAROLINA ASHEVILLE N.C.

ARCHITECTURAL DESIGN STUDIO PA ASHEVILLE NC CERT.NO 50382

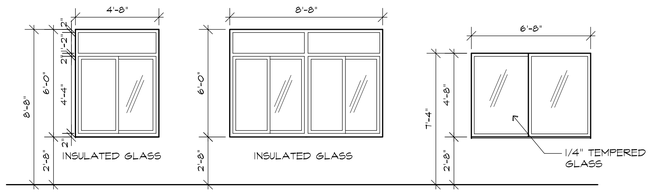
10/18/16

Door Types
Scale 1/4" = 1'-0"



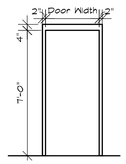
(A) Hollon Metal Door
(B) Solid Core Wood Door - Full Glass
(C) Solid Core Wood Door
(D) Hollon Metal Door
(E) 12' X 12' OH Insulated Sectional Door

Window Types
Scale: 1/4"=1'-0"

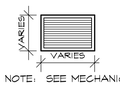


(A) Slider w/ Fixed Above
(B) Sliders w/ Fixed Above
(C) Pass Thru Slider Window

Frame Types
Scale 1/4" = 1'-0"

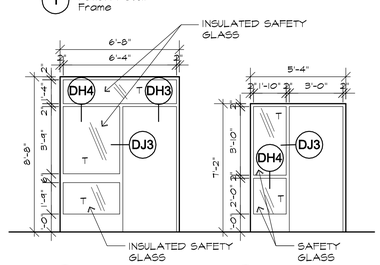


Louver/FanTypes
Scale: 1/4"=1'-0"



NOTE: SEE MECHANICAL

ML



(1) Hollon Metal Frame
(2) Hollon Metal Frame
(3) Hollon Metal Frame

Door Schedule

Refer to Details This Sheet for Head Jamb & Sill Numbers Listed Below, u.o.n.

Door No.	Size	Door Type	Frame Type	Head	Jamb	Sill	Remarks	HDW	Door No.
1	3'-0" x 7'-0" x 1-3/4"	A	2	2/A-5&DH3	DJ4	2/A-5		1	1
2	3'-0" x 7'-0" x 1-3/4"	B	1	DH1	DJ1	-		2	2
3	3'-0" x 7'-0" x 1-3/4"	C	1	DH1	DJ1			3	3
4	3'-0" x 7'-0" x 1-3/4"	C	1	DH1	DJ1			3	4
5	3'-0" x 7'-0" x 1-3/4"	C	1	DH1	DJ1			3	5
6	3'-0" x 7'-0" x 1-3/4"	B	3	DH1	DJ1			4	6
7	3'-0" x 7'-0" x 1-3/4"	C	1	DH1	DJ1			3	7
8	3'-0" x 7'-0" x 1-3/4"	A	2	2/A-5&DH3	DJ4	2/A-5		1	8
9	3'-8" x 7'-0" x 1-3/4"	D	1	DH5	DJ4	DS2		5	9
10	3'-0" x 7'-0" x 1-3/4"	C	1	DH1	DJ1			6	10
11	3'-0" x 7'-0" x 1-3/4"	C	1	DH2	DJ2	DS1		7	11
12	3'-0" x 7'-0" x 1-3/4"	C	1	DH1	DJ1	DS1		8	12
13	3'-8" x 7'-0" x 1-3/4"	D	1	DH5	DJ4	DS2		9	13
14	3'-0" x 7'-0" x 1-3/4"	C	1	DH1	DJ1			3	14
15	3'-0" x 7'-0" x 1-3/4"	D	1	DH6	DJ4	DS2		11	15
16	3'-0" x 7'-0" x 1-3/4"	D	1	DH6	DJ4	DS2		11	16
17	12'-0" x 12'-0"	E		DH7	DJ5	DS3		10	17

Window Schedule

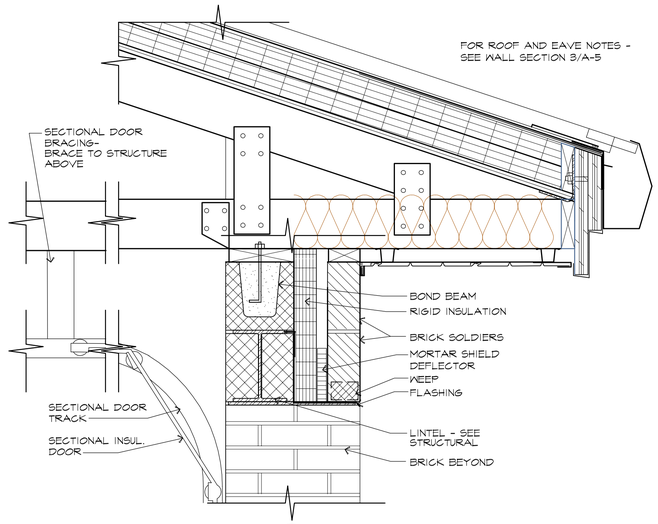
Head, Jamb & Sill Details are Referenced from this Sheet U.N.O.

Window Mark	Size W & H	Head	Jamb	Sill	Remarks	Window Mark
A	4'-8" x 6'-0"	WH1	WJ2	WS2	Slider w/ Fixed Above	A
B	8'-8" x 6'-0"	WH1	WJ2	WS2	Slider w/ Fixed Above	B
C	6'-8" x 4'-8"				Pass Thru Slider	C

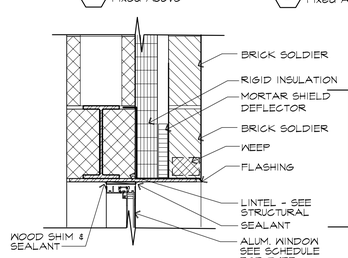
Louver/Fan Schedule

See Mechanical Dwgs.

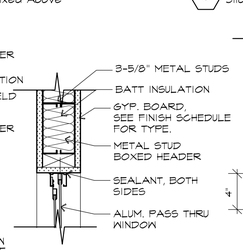
Louver Mark	Size W & H	Head	Jamb	Sill	Remarks	Louver Mark
ML	VARIES	MLH1	MLJ1	MLS1	SEE MECHANICAL FOR SIZES AND DETAILS	ML



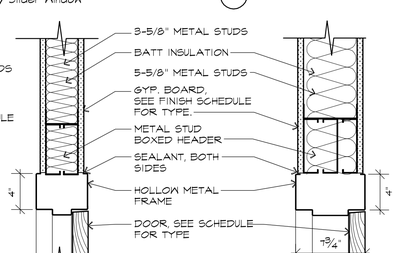
DH7



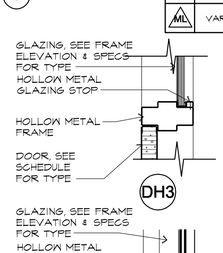
WH1



WH2



DH1 DH2



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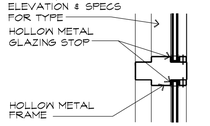
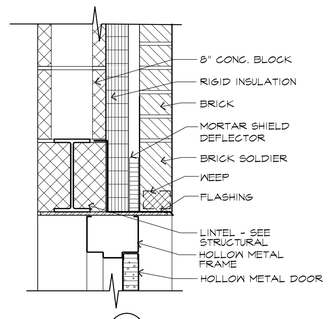


DH4



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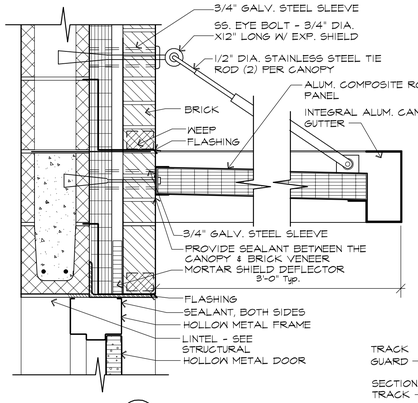

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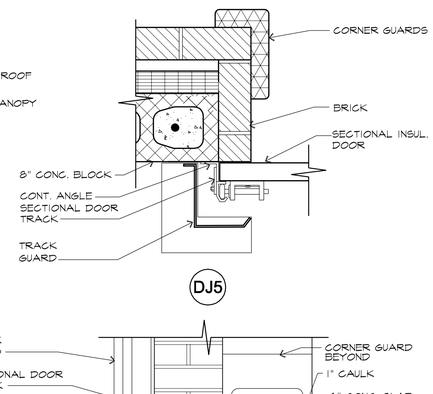

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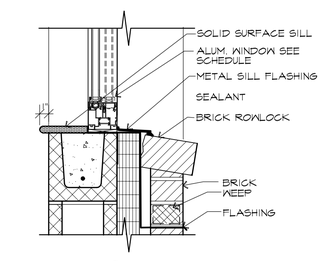
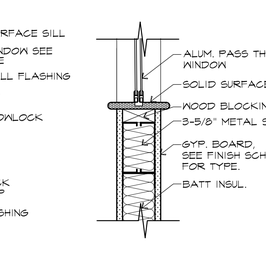
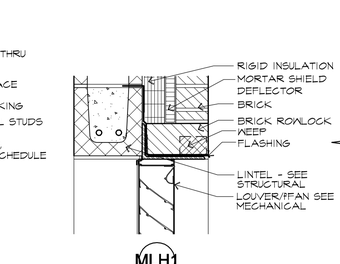


WJ1



WJ2



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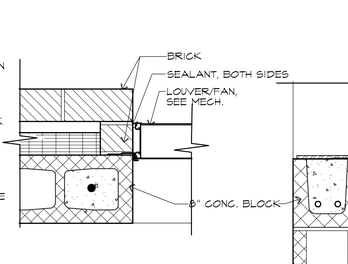

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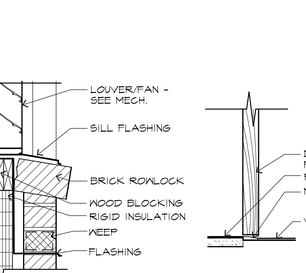

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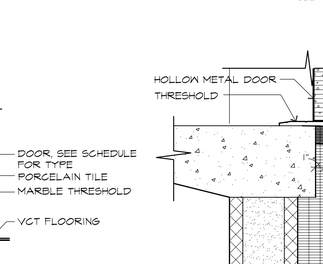

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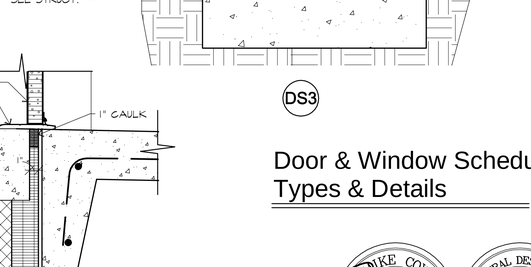

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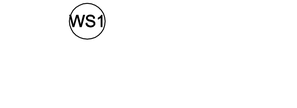
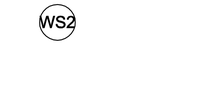


WS1



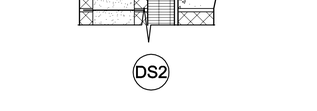
WS2

MLH1

MLJ1

MLS1

DS1



DS2

Door & Window Schedules, Types & Details

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ARCHITECTURAL DESIGN STUDIO P.A. CERT.NO 50382 ASHEVILLE NC

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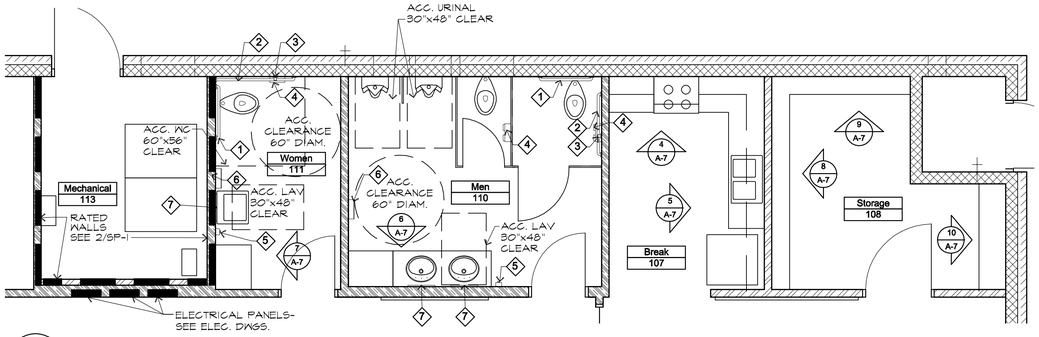
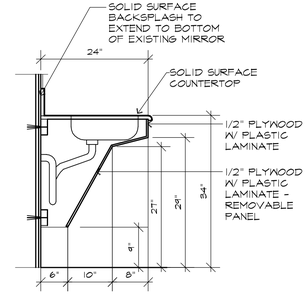
Department. of Transportation, Raleigh, NC SCO # 141126301A

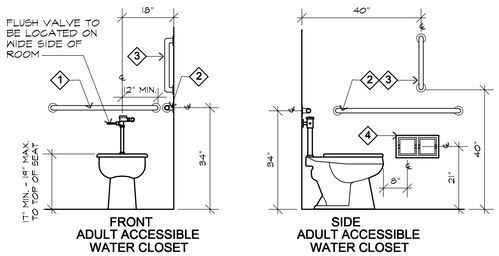
A-6



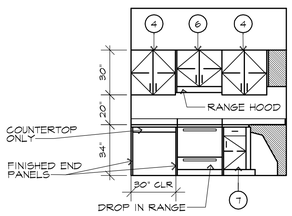
1 / A-7 **Enlarged Plan**
1/4" = 1'-0"



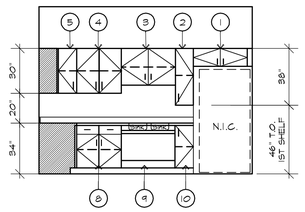
2 / A-7 **Accessible Sink**
3/4" = 1'-0"



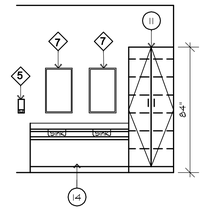
3 / A-7 **Accessible Toilet Elevations**
1/2" = 1'-0"



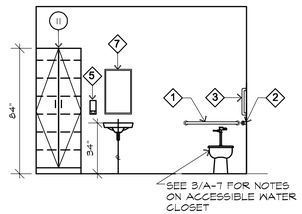
4 / A-7 **Cabinet Elevation**
1/4" = 1'-0"



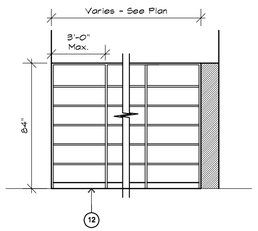
5 / A-7 **Cabinet Elevation**
1/4" = 1'-0"



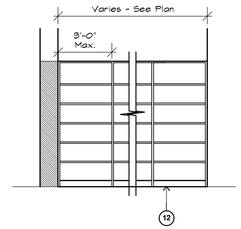
6 / A-7 **Cabinet Elevation**
1/4" = 1'-0"



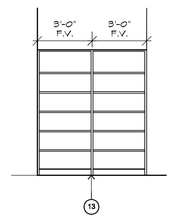
7 / A-7 **Cabinet Elevation**
1/4" = 1'-0"



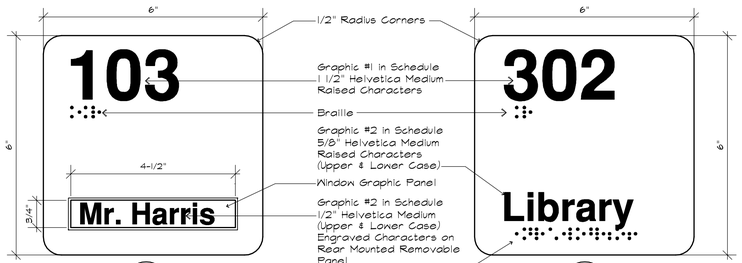
8 / A-7 **Cabinet Elevation**
1/4" = 1'-0"



9 / A-7 **Cabinet Elevation**
1/4" = 1'-0"



10 / A-7 **Cabinet Elevation**
1/4" = 1'-0"



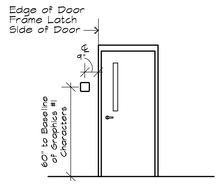
1 **Window Room Identification**

2 **Typical Room Identification**

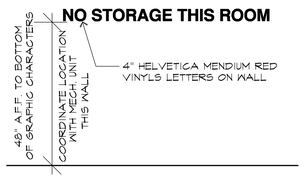
T Signs Noted Thus in the Message List Schedule Are Standard Toilet Signs of the Type Noted in the Schedule and Specifications.

11 / A-7 **Sign Types**
6" = 1'-0"

NOTE: SIGN TYPES SHOWN HERE ARE DIAGRAMMATIC, AND INDICATE THE REQUIREMENTS OF ICC/ANSI 117.1 - 2003 EDITION. ACTUAL SIGNS MAY DIFFER IN SIZE AND STYLE, PROVIDING THESE REQUIREMENTS ARE MET.



12 / A-7 **Room Identification Sign Location**
1/4" = 1'-0"



13 / A-7 **Sign Location**
N.T.S.

Room Identification Signage

Door Number	Sign Type	Graphic #1	Graphic #2	Remarks*
3	1	101	WINDOW	OFFICE NAME PROVIDED BY OWNER
4	1	102	WINDOW	OFFICE NAME PROVIDED BY OWNER
5	1	103	WINDOW	OFFICE NAME PROVIDED BY OWNER
6	2	ASSEMBLY		
7	1	105	WINDOW	OFFICE NAME PROVIDED BY OWNER
8	2	ASSEMBLY		
9	2	ICE		
10	2	STORAGE		
11	T	MENS ACCESSIBLE TOILET SIGN		
12	T	WOMENS ACCESSIBLE TOILET SIGN		
13	2	MECHANICAL		
14	2	RECEPTION		

Toilet Accessories Mounting Height Schedule

MARK	SPEC. DESIG.	DESCRIPTION	HEIGHT A.F.F.
1	GB-1	36" GRAB BAR	CENTERLINE 34"
2	GB-2	42" GRAB BAR	CENTERLINE 34"
3	GB-3	VERTICAL GRAB BAR 18" LONG	BOTTOM 40"
4	TTD-1	TISSUE DISPENSER	CENTERLINE 21"
5	SD	SOAP DISPENSER	SPOUT @ 42"
6	PTD	PAPER TOWEL DISPENSER	DISPENSER @ 48"
7	GM	MIRROR	BOTTOM 40"

Casework Schedule

MARK	DIMENSIONS WxDxH	DESRIPTION
1	36"x 18" HEIGHT 12"	WALL CABINET, 12" HEIGHT, ADJUSTABLE SHELF, 2 DOORS
2	12" x 12" HEIGHT 36"	WALL CABINET, 36" HEIGHT, ADJUSTABLE SHELF, 1 DOOR
3	36" x 12" HEIGHT 24"	WALL CABINET, 24" HEIGHT, ADJUSTABLE SHELF, 2 DOORS
4	30" x 12" HEIGHT 30"	WALL CABINET, 30" HEIGHT, ADJUSTABLE SHELF, 2 DOORS
5	12"x 12" HEIGHT 30"	WALL CABINET, 30" HEIGHT, ADJUSTABLE SHELF, 1 DOOR
6	30" x 12" HEIGHT 24"	WALL CABINET, 24" HEIGHT, ADJUSTABLE SHELF, 2 DOORS
7	15" x 24" HEIGHT 34"	BASE CABINET, ADJUSTABLE SHELF, 1 DRAWER, 1 DOOR
8	30" x 24" HEIGHT 34"	BASE CABINET, ADJUSTABLE SHELF, 2 DRAWERS, 2 DOORS
9	36" x 24"	ACCESSIBLE SINK CABINET - SEE 2/A-7
10	15" x 24" HEIGHT 34"	BASE CABINET, ADJUSTABLE SHELF, 1 DOOR
11	30" x 24" HEIGHT 84"	TALL CABINET W/ ADJUTABLE SHELVES, 2 DOORS, LOCKABLE
12	12" x VARIES HEIGHT 84"	SOLID WOOD STORAGE SHELVES & UPRIGHTS, ADJ. SHELVES
13	18" x VARIES HEIGHT 84"	SOLID WOOD STORAGE SHELVES & UPRIGHTS, ADJ. SHELVES
14	66" x 24"	ACCESSIBLE SINK CABINET - SEE 2/A-7

NOTES:
1. COUNTER HEIGHT 34" U.O.N.
2. MOUNT WALL CABINETS @ 84"" A.F.F. TO TOP OF CABINET U.O.N.
3. COUNTER BACKSPLASH IS 4", TYPICAL. PROVIDE BACKSPLASH AT ALL COUNTERTOPS, U.O.N.
4. CABINET TOE IS 4" U.O.N.

Enlarged Plans & Casework

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

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70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

MIKE COX REGISTERED ARCHITECT 6537 10/18/16 ASHEVILLE, N.C. NORTH CAROLINA

ARCHITECTURAL DESIGN STUDIO PA CERT.NO 50382 ASHEVILLE NC

10/18/16

STRUCTURAL ABBREVIATIONS

Dwg.# ANNOT-ABBREVIATIONS-STRU.dwg

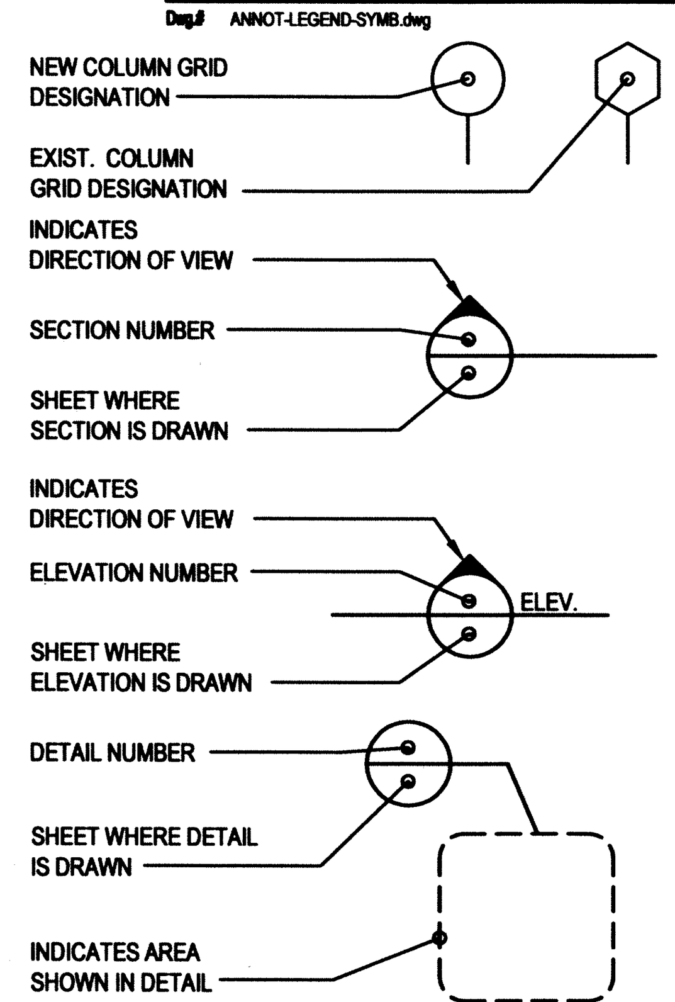
A.B.	ANCHOR BOLT
ACI	AMERICAN CONCRETE INSTITUTE
A.F.F.	ABOVE FINISHED FLOOR
AISC	AMERICAN INSTITUTE OF STEEL CONSTRUCTION
AITC	AMERICAN INSTITUTE OF TIMBER CONSTRUCTION
ALT.	ALTERNATE
ARCH.	ARCHITECTURAL
ASTM	AMERICAN SOCIETY FOR TESTING AND MATERIALS
AVG.	AVERAGE
AWS	AMERICAN WELDING SOCIETY
BLDG.	BUILDING
BM.	BEAM
B.P.	BEARING PLATE;BASE PLATE
BRG.	BEARING
C.J.	CONSTRUCTION JOINT
CMU	CONCRETE MASONRY UNIT
CGS	CENTER OF GRAVITY OF STEEL
CL.	CENTERLINE
CLG.	CEILING
CLR.	CLEAR
COL.	COLUMN
CONC.	CONCRETE
CONN.	CONNECTION
CONST.	CONSTRUCTION
CONT.	CONTINUOUS
CRSI	CONCRETE REINFORCING STEEL INSTITUTE
CTR.	CENTER
D.C.J.	DOWELED CONTROL JOINT
D.J.	DOUBLE JOIST
D.S.	DOWN SPOUT
DBL.	DOUBLE
DET.	DETAIL
DIA.	DIAMETER
DIAG.	DIAGONAL
DIM.	DIMENSION
DL	DEAD LOAD
DN.	DOWN
DWG(S).	DRAWING(S)
E.F.	EACH FACE
E.S.	EACH SIDE
E.W.	EACH WAY
E-W	EAST-WEST
EA.	EACH
ELEV.	ELEVATION; ELEVATOR
ENGR.	ENGINEER
EQ.	EQUAL
EXIST.	EXISTING
E.J.	EXPANSION JOINT
EXT.	EXTERIOR
F.D.	FLOOR DRAIN
F.F.	FAR FACE
FDN.	FOUNDATION
FIN.	FINISH
FL.	FLOOR
FLG.	FLANGE
F.O.B.	FACE OF BRICK
FT.	FOOT; FEET
FTG.	FOOTING

G.B.	GRADE BEAM
GA.	GAGE; GAUGE
GALV.	GALVANIZED
H.M.	HOLLOW METAL
H.S.	HIGH STRENGTH
HEX. HD.	HEXAGONAL HEAD
HSS	HOLLOW STRUCTURAL SHAPE
HT.	HEIGHT
I.D.	INSIDE DIAMETER
I.F.	INSIDE FACE
IN.	INCH;INCHES
IBC	INTERNATIONAL BUILDING CODE
INT.	INTERIOR;INTERSECTION
JST.	JOIST
JT.	JOINT
K	KIP (1,000 LBS.)
K/FT	KIPS PER FOOT
LLBB	LONG LEGS BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLO	LONG LEG OUTSTANDING
LLV	LONG LEG VERTICAL
L.W.	LONG WAY
LB.	POUND
LG.	LONG
LIN.	LINEAR
LL	LIVE LOAD
LT. WT.	LIGHT WEIGHT
M.O.S.	MIDDLE OF SLAB
M.O.W.	MIDDLE OF WALL
MATL.	MATERIAL
MAX.	MAXIMUM
MIN.	MINIMUM
MISC.	MISCELLANEOUS
MK	MARK
N/A	NOT APPLICABLE
N.F.	NEAR FACE
N.I.C.	NOT IN CONTRACT
N.T.S.	NOT TO SCALE
N-S	NORTH-SOUTH
NCSBC	NORTH CAROLINA STATE BUILDING CODE
NO.	NUMBER
NOM.	NOMINAL
O/C	ON CENTER
O.D.	OUTSIDE DIAMETER
O.F.	OUTSIDE FACE
OPNG.	OPENING
OPP.	OPPOSITE
O.H.	OPPOSITE HAND
ORIG.	ORIGINAL

P/S	PRESTRESSED
P/T	POST-TENSIONING
P.C.	PRECAST CONCRETE
PCI	PRESTRESSED CONCRETE INSTITUTE
PEN.	PENETRATION
PERP.	PERPENDICULAR
PL.	PLATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
P.T.	PRESSURE TREATED
PTI	POST-TENSIONING INSTITUTE
PVC	POLYVINYL CHLORIDE
R.	RADIUS
R.D.	ROOF DRAIN
RAD.	RADIUS
REF.	REFERENCE
REINF.	REINFORCE(D); REINFORCING
REM.	REMAINING; REMAINDER
REQ'D.	REQUIRED
S.J.	SAWED JOINT
S.S.	STAINLESS STEEL
S.W.	SHORT WAY
SCHED.	SCHEDULE
SECT.	SECTION
SHT.	SHEET
SIM.	SIMILAR
SJI	STEEL JOIST INSTITUTE
SLBB	SHORT LEGS BACK TO BACK
SLO	SHORT LEG OUTSTANDING
S.O.G.	SLAB ON GRADE
SPEC(S).	SPECIFICATION(S)
SQ.	SQUARE
STD.	STANDARD
STL.	STEEL
STRUCT.	STRUCTURAL
SYM.	SYMMETRICAL
T.O.C.	TOP OF CONCRETE
T.O.F.	TOP OF FOOTING
T.O.S.	TOP OF SLAB; TOP OF STEEL
T.O.W.	TOP OF WALL
T&B	TOP AND BOTTOM
TEMP.	TEMPORARY
THRU	THROUGH
TYP.	TYPICAL
U.L.	UNDERWRITERS LABORATORIES
U.N.O.	UNLESS NOTED OTHERWISE
W/O	WITHOUT
W/	WITH
W.P.	WORKING POINT
W.W.F.	WELDED WIRE FABRIC
X	BY

DRAWING SYMBOL LEGEND

Dwg.# ANNOT-LEGEND-SYMB.dwg



STRUCTURAL DESIGN DATA

1. CODES AND STANDARDS:
   - A. 2012 N. C. REVISIONS TO THE 2009 INTERNATIONAL BUILDING CODE.
   - B. MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES, ASCE 7-05.
   - C. BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 318-08.
   - D. BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES, ACI 530-08.
   - E. SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS, AISC 360-05.
   - F. AF&PA - NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION.
2. FOUNDATIONS:
   - A. FOOTINGS - ALLOWABLE SOIL BEARING PRESSURE — 3000 PSF
   - B. ROOF LIVE LOAD (MINIMUM) — 20 PSF
   - C. ROOF TRUSS LOADS:
     - (1) LIVE LOADS
       - (a) TOP CHORD (MINIMUM) — 20 PSF
       - (b) BOTTOM CHORD - ATTIC — 5 PSF
     - (2) DEAD LOADS
       - (a) TOP CHORD — 9 PSF
       - (b) BOTTOM CHORD - SUSPENDED — 6 PSF
     - (3) DEAD LOADS - MINIMUM VALUES FOR USE WITH WIND UPLIFT
       - (a) TOP CHORD — 5 PSF
       - (b) BOTTOM CHORD - SUSPENDED — 3 PSF
   - D. ROOF SNOW LOADS:
     - (1) GROUND SNOW LOAD. — 15 PSF
     - (2) FLAT ROOF SNOW LOAD — 15 PSF
     - (3) OCCUPANCY CATEGORY — II
     - (4) IMPORTANCE FACTOR — 1.0
     - (5) Ce — 1.0
     - (6) Ct. — 1.0
   - E. OTHER DEAD LOADS: PER CONSTRUCTION SHOWN ON DWGS
3. WIND LOADS:
   - A. BASIC WIND VELOCITY — 90 MPH
   - B. OCCUPANCY CATEGORY — II
   - C. IMPORTANCE FACTOR — 1.0
   - D. EXPOSURE CATEGORY — C
   - E. INTERNAL PRESSURE COEFFICIENT — +/-0.18
   - F. DESIGN BASE SHEAR: ASSEMBLY BUILDING / STORAGE BUILDING
     - (1) EAST-WEST DIRECTION — 5 KIPS / 5 KIPS
     - (2) NORTH-SOUTH DIRECTION — 8 KIPS / 6 KIPS
4. EARTHQUAKE LOADS:
   - A. MAPPED SPECTRAL RESPONSE ACCELERATION, SHORT PERIOD — SS = 0.293
   - B. MAPPED SPECTRAL RESPONSE ACCELERATION, 1 SECOND PERIOD — S1 = 0.104
   - C. DESIGN SPECTRAL RESPONSE ACCELERATION, SHORT PERIOD — SDS = 0.306
   - D. DESIGN SPECTRAL RESPONSE ACCELERATION, 1 SECOND PERIOD — SD1 = 0.165
   - E. SITE CLASS. — D
   - F. OCCUPANCY CATEGORY (SEISMIC USE GROUP) — II
   - G. IMPORTANCE FACTOR — 1.0
   - H. SEISMIC DESIGN CATEGORY — C
   - I. SEISMIC FORCE RESISTING SYSTEM
     - (1) BEARING WALLS - INTERMEDIATE REINFORCED MASONRY SHEAR WALLS
     - (2) RESPONSE MODIFICATION COEFFICIENT (R) — 3.5
     - (3) SYSTEM OVERSTRENGTH FACTOR (ΩO) — 2.5
     - (4) DEFLECTION AMPLITUDE FACTOR (Cd) — 2.25
     - (5) SEISMIC RESPONSE COEFFICIENT (Cs) — 0.87
   - J. ANALYSIS PROCEDURE - EQUIVALENT LATERAL FORCE
   - K. DESIGN BASE SHEAR: ASSEBLY BUILDING / STORAGE BUILDING
     - (1) EAST-WEST DIRECTION. — 15 KIPS / 9 KIPS
     - (2) NORTH-SOUTH DIRECTION. — 15 KIPS / 9 KIPS

FOUNDATIONS

1. THE CONTRACTOR IS TO REVIEW THE SUBSURFACE EXPLORATION REPORT PERFORMED FOR THIS PROJECT BY BUNNELL-LAMMONS ENGINEERING, INC. (BLE JOB NO: J15-10304-01) BEFORE COMMENCEMENT OF SITE GRADING TO BECOME GENERALLY FAMILIAR WITH SUBSURFACE CONDITIONS WHICH MAY BE ENCOUNTERED DURING CONSTRUCTION. ALL SUBGRADE PREPARATION SHALL BE PERFORMED AS DEFINED IN THE PLANS AND SPECIFICATIONS AND IN COOPERATION WITH THE OWNER'S GEOTECHNICAL TESTING SERVICE.
2. SPECIAL FOUNDATIONS FOR THE SUPPORT OF MECHANICAL, ELECTRICAL, OR OTHER EQUIPMENT INSIDE OR OUTSIDE OF THE BUILDING SHALL BE DESIGNED BY THE EQUIPMENT SUPPLIER(S) AND REVIEWED BY THE STRUCTURAL ENGINEER FOR COMPATIBILITY WITH THE BUILDING FOUNDATION SYSTEM. DRAWINGS OF THE FOUNDATIONS SHALL BE SEALED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA.
3. FOUNDATION DRAINAGE AND GROUNDWATER CONTROL SYSTEMS MAY BE INDICATED IN PART ON THE STRUCTURAL DRAWINGS TO SHOW APPROXIMATE LOCATIONS RELATIVE TO CERTAIN STRUCTURAL COMPONENTS. FOUNDATION DRAINAGE AND GROUNDWATER CONTROL SYSTEMS ARE NOT A PART OF THE STRUCTURAL DESIGN. SEE OTHER DRAWINGS FOR DESIGN REQUIREMENTS OF THESE SYSTEMS.
4. ALL FOOTINGS ARE DESIGNED TO BEAR ON RESIDUAL SOIL OR COMPACTED ENGINEERED FILL AND TO HAVE A MINIMUM BEARING CAPACITY AS LISTED UNDER "STRUCTURAL DESIGN DATA" IN THE GENERAL NOTES. FOOTING EXCAVATIONS ARE TO BE INSPECTED BY AN INDEPENDENT TESTING LABORATORY FOR SUITABLE SOILS, BEARING PRESSURE, AND COMPACTION. SEE GEOTECHNICAL REPORT FOR COMPACTION REQUIREMENTS.
5. RETAINING WALLS:
   - A. ALL RETAINING WALLS SHOWN ON THE STRUCTURAL DRAWINGS HAVE BEEN DESIGNED FOR THE LATERAL EARTH PRESSURES SHOWN IN THE GENERAL NOTES UNDER STRUCTURAL DESIGN DATA. RETAINING WALLS REQUIRE A FOUNDATION DRAINAGE SYSTEM WHICH IS DESIGNED TO PREVENT THE BUILD-UP OF HYDROSTATIC PRESSURE BEHIND THE WALL.
   - B. DO NOT BACKFILL AGAINST RETAINING WALLS UNTIL WALL MATERIALS HAVE REACHED THEIR REQUIRED STRENGTH AND ANY REQUIRED BRACING IS INSTALLED. BACKFILL NON-RETAINING FOUNDATION WALLS SIMULTANEOUSLY ON BOTH SIDES.
6. SEE FOUNDATION PLAN NOTES FOR FURTHER REQUIREMENTS.

CONCRETE

1. CONCRETE SHALL BE NORMAL WEIGHT CONCRETE UNLESS NOTED OTHERWISE. CONCRETE SHALL HAVE THE FOLLOWING MINIMUM 28-DAY COMPRESSIVE STRENGTHS UNLESS NOTED OTHERWISE IN THE PLANS OR SPECIFICATIONS.

   PERMANENTLY EXTERIOR EXPOSED CONCRETE — 4000 PSI
   ALL OTHER CONCRETE — 3000 PSI
2. CONCRETE PERMANENTLY EXPOSED TO WEATHER SHALL HAVE A MAXIMUM WATER/CEMENT RATIO OF 0.45 AND SHALL CONTAIN APPROXIMATELY 6% ENTRAINED AIR. SEE SPECIFICATIONS FOR FURTHER REQUIREMENTS.
3. CONCRETE SHALL BE BATCHED USING MATERIALS AND PROPORTIONS DESIGNATED IN THE APPROVED DESIGN MIXES. THE GENERAL CONTRACTOR SHALL PROVIDE QUALITY CONTROL OF THE CONCRETE MIX.
4. CONCRETE SLUMP SHALL BE AS INDICATED IN THE SPECIFICATIONS.
5. THE ADDITION OF WATER TO INCREASE SLUMPS ABOVE THE LEVEL SPECIFIED OR TO RETEMPER CONCRETE WHICH HAS EXPERIENCED SLUMP LOSS DUE TO EXCESSIVE MIXING OR HEAT BUILD-UP IS NOT PERMITTED.
6. CONCRETE SHALL BE HANDLED, PLACED, AND CONSOLIDATED IN ACCORDANCE WITH THE REQUIREMENTS OF THE SPECIFICATIONS.
7. SEE SPECIFICATIONS FOR CURING AND HOT AND COLD WEATHER REQUIREMENTS FOR CONCRETE.
8. PROVIDE PRE-MOLDED EXPANSION-JOINT FILLER AT EDGES OF SLABS ON GRADE AGAINST VERTICAL SURFACES UNLESS NOTED OTHERWISE.
9. DOWELS FROM FOOTINGS SHALL BE ACCURATELY LOCATED AND SECURELY TIED IN PLACE PRIOR TO PLACEMENT OF THE CONCRETE. PLACEMENT OF DOWELS IN FRESH CONCRETE AFTER THE CONCRETE HAS BEEN PLACED WILL NOT BE PERMITTED. USE TEMPLATES FOR THE PLACEMENT OF DOWELS IN COLUMNS AND SHEAR WALLS.
10. THE CONTRACTOR SHALL USE INSTRUMENTS TO MAINTAIN A CONTINUOUS CHECK OF THE ELEVATIONS OF THE TOP SURFACES OF SLABS DURING THE PLACEMENT AND FINISHING OF THE CONCRETE. ADJUSTMENTS SHALL BE MADE TO MAINTAIN THE SURFACES WITHIN THE SPECIFIED TOLERANCES.
11. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING AND INSTALLING ALL ANCHOR BOLTS, CLIPS, INSERTS, SLEEVES AND OTHER REQUIRED ITEMS IN ACCORDANCE WITH THE CONTRACT DOCUMENTS AND IN COOPERATION WITH OTHER TRADES PRIOR TO THE PLACING OF CONCRETE.
12. CONCRETE FORMWORK SHALL NOT BE REMOVED UNTIL CONCRETE HAS REACHED SUFFICIENT STRENGTH TO NOT BE DAMAGED BY FORMWORK REMOVAL. SEE ALSO SPECIFICATIONS.

REINFORCING STEEL

1. DETAILING, FABRICATION, STORAGE, AND INSTALLATION OF REINFORCING, UNLESS OTHERWISE SHOWN ON THE PLANS, SHALL COMPLY WITH APPLICABLE REQUIREMENTS OF THE "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318) AND THE "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE STRUCTURES" (ACI 315), BOTH BY THE AMERICAN CONCRETE INSTITUTE.
2. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60. REINFORCING STEEL WELDED TO EMBED STEEL PLATES OR SHAPES SHALL CONFORM TO ASTM A706. DO NOT WELD REINFORCING BARS TO EACH OTHER.
3. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185.
4. UNLESS NOTED OTHERWISE ON PLANS OR IN DETAILS, REINFORCING BARS MARKED ON THE PLANS AS BEING CONTINUOUS SHALL BE LAPPED AT SPLICE LOCATIONS AS SHOWN IN SCHEDULE. FOR SPLICES AT CORNERS OR INTERSECTIONS OF WALLS AND BEAMS, SEE TYPICAL DETAILS.
5. REINFORCING STEEL SHALL BE CLEAN OF MUD, DEBRIS, LOOSE RUST, CEMENT GROUT, OR ANY OTHER MATERIAL WHICH MAY INHIBIT BOND BETWEEN THE STEEL AND THE CONCRETE.
6. REINFORCING SHALL BE SECURELY TIED AND ANCHORED IN PLACE BEFORE CONCRETE PLACEMENT, TO PREVENT DISLOCATION.
7. UNLESS OTHERWISE NOTED, CONCRETE COVERAGE ON REINFORCING STEEL SHALL BE AS FOLLOWS:

   FOOTINGS - ALL FACES — 3"
   SLAB-ON-GRADE - TOP — 1"
   SLAB-ON-GRADE - BOTTOM — 2"
8. BARS SHALL BE BENT ONLY USING APPROVED METHODS. BARS SHALL NOT BE BENT AFTER PARTIAL EMBEDMENT IN HARDENED CONCRETE.

REINFORCED CONCRETE MASONRY

1. DETAILS FOR MASONRY CONSTRUCTION ON THE STRUCTURAL DRAWINGS ARE LIMITED IN SCOPE TO SHOW STRUCTURAL REQUIREMENTS ONLY. SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR FURTHER REQUIREMENTS OF MASONRY CONSTRUCTION INCLUDING UNIT TYPES AND SIZES; PLACING PATTERNS; JOINT REINFORCING; VENEER TIES; CONTROL, ISOLATION, AND EXPANSION JOINTS; INSULATION; DAMPPROOFING; ETC. SEE DRAWINGS OF OTHER TRADES FOR OPENINGS AND OTHER SPECIAL REQUIREMENTS.
2. MASONRY CONSTRUCTION SHALL CONFORM TO ACI 530. CONCRETE MASONRY BLOCK SHALL CONFORM TO ASTM C90. THE PORTLAND CEMENT/LIME MORTAR SHALL CONFORM TO ASTM C270, TYPE-S. GROUT FOR FILLED MASONRY SHALL BE FINE OR COARSE GROUT APPROPRIATELY SELECTED FOR THE WIDTH OF GROUT SPACE PER ACI 530. GROUT SHALL CONFORM TO ASTM C476 WITH A MAXIMUM AGGREGATE SIZE OF 3/8" FOR COARSE GROUT AND A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS WHEN TESTED IN ACCORDANCE WITH ASTM C1019. THE NET AREA COMPRESSIVE STRENGTH OF MASONRY SHALL BE AT LEAST 1500 PSI.
3. PROPORTIONING OF ALL MORTAR SHALL BE ONLY BY VOLUME MEASUREMENT, NOT BY SHOVEL COUNT. MORTAR SHALL BE PROPORTIONED USING THE SAME PORTLAND CEMENT, HYDRATED LIME AND FINE AGGREGATE THAT ARE SELECTED AND APPROVED FOR THE ENTIRE PROJECT. MORTAR SHALL BE MIXED IN ACCORDANCE WITH THE REQUIREMENTS OF ASTM C270, "SPECIFICATION FOR MORTAR FOR UNIT MASONRY".
4. SOLID GROUT FILL SHALL BE PROVIDED IN ALL MASONRY BELOW GRADE, IN ALL CAVITIES WITH REINFORCING BARS, IN ALL CAVITIES WITH EMBEDDED OR DRILLED-IN ANCHORS, AND AS INDICATED. GROUT FILL SHALL COMPLETELY AND SOLIDLY FILL REQUIRED SPACES.
5. ALL MASONRY CAVITIES WHICH ARE TO BE FILLED WITH GROUT SHALL BE FILLED IN LIFTS NOT EXCEEDING 4'-0". IF NECESSARY TO OBTAIN COMPLETE FILL, LIFT HEIGHT SHALL BE REDUCED. CARE SHALL BE TAKEN WHILE LAYING BLOCK TO PREVENT MORTAR AND OTHER DEBRIS FROM FALLING INTO THE CAVITIES AND PREVENTING THE GROUT FROM COMPLETELY FILLING THE CAVITIES. GROUT SHALL BE CONSOLIDATED AT PLACEMENT AND AGAIN AFTER INITIAL WATER LOSS AND SETTLEMENT HAS OCCURRED.
6. WHERE REINFORCING IS SPECIFIED TO BE PLACED IN MASONRY CAVITIES, REINFORCING SHALL BE SECURELY TIED IN POSITION AT THE PROPER LOCATION WITHIN THE MASONRY PRIOR TO FILLING WITH GROUT. PROVIDE BAR SUPPORTS AND POSITIONERS AS REQUIRED. INSERTION OF UNSECURED REINFORCEMENT INTO MASONRY CAVITIES OR INTO GROUT FILL SHALL NOT BE PERMITTED.
7. SEE MISCELLANEOUS LINTEL SCHEDULE FOR REQUIRED LINTELS IN MASONRY WALLS NOT OTHERWISE SHOWN ON DRAWINGS.
8. ALL CONCRETE MASONRY SHALL BE REINFORCED WITH THE MINIMUM REINFORCING SHOWN IN THE TYPICAL CONCRETE MASONRY REINFORCING DETAIL, UNLESS NOTED OTHERWISE.
9. PROVIDE BRACING AT TOP OF ALL MASONRY WALLS. SEE TYPICAL DETAILS.

STRUCTURAL STEEL

1. ROLLED STEEL W-SHAPES SHALL CONFORM TO ASTM A992, GRADE 50, FY=50 KSI. STEEL PIPE SHALL CONFORM TO ASTM A53, TYPE-E, GRADE-B, FY=35 KSI. COLD FORMED STEEL TUBING SHALL CONFORM TO ASTM A500, GRADE-B, FY=46 KSI. ALL OTHER ROLLED STEEL SHAPES, PLATES, AND BARS, SHALL CONFORM TO ASTM A36, FY=36 KSI. ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 36.
2. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH AISC SPECIFICATIONS, COMMENTARY, AND CODE OF STANDARD OF PRACTICE.
3. CONNECTIONS NOT DETAILED ON THE PLANS SHALL BE DESIGNED AND DETAILED BY THE FABRICATOR AND APPROVED BY THE DESIGNER. CONNECTION DESIGNS SHALL COMPLY WITH THE REQUIREMENTS OF THE NORTH CAROLINA STATE BUILDING CODE AND "AISC SEISMIC PROVISIONS FOR STURCTURAL STEEL BUILDINGS, AISC 341-05 & AISC 341S1-05".
4. WELDS:
   - A. ALL WELDS SHALL BE MADE IN ACCORDANCE WITH AWS D1.1 STRUCTURAL WELDING CODE - STEEL BY THE AMERICAN WELDING SOCIETY FOR THE MATERIAL BEING WELDED. WELDS SHALL BE MADE USING E70XX LOW-HYDROGEN ELECTRODES UNLESS OTHERWISE NOTED.
   - B. GALVANIZED STEEL SHALL BE WELDED IN ACCORDANCE WITH AWS D19 - WELDING ZINC COATED STEEL BY THE AMERICAN WELDING SOCIETY. STEEL SURFACES SHALL BE FREE OF ZINC IN THE AREA TO BE WELDED.
   - C. WELDS SHALL BE MADE BY WELDERS WHO HAVE BEEN QUALIFIED BY TESTS AS PRESCRIBED IN AWS D1.1 BY THE AMERICAN WELDING SOCIETY, TO PERFORM THE TYPE OF WORK REQUIRED.
   - D. ALL SHOP WELDS SHALL BE A MINIMUM 3/16" AND ALL FIELD WELDS SHALL BE A MINIMUM 1/4", UNLESS NOTED OTHERWISE. INDICATED WELDING OF CONNECTED PARTS SHALL BE "CONTINUOUS" OR "ALL AROUND" AS APPLICABLE, UNLESS NOTED OTHERWISE.
   - E. WELDS SHALL BE CLEANED AND TOUCHED UP WITH THE APPROPRIATE PAINT OR ZINC COATING.
   - F. PROVIDE SEAL WELDS ON ALL WELDED STEEL JOINTS EXPOSED TO VIEW, MOISTURE, OR CORROSIVE CONDITIONS WHICH WOULD NOT OTHERWISE BE WELDED FOR STRENGTH.
5. BOLTED CONNECTIONS SHALL BE MADE USING HIGH-STRENGTH BOLTS, 3/4" DIAMETER CONFORMING TO ASTM A325N, UNLESS OTHERWISE NOTED ON PLAN. SEE SPECIFICATIONS FOR BOLT TIGHTENING METHODS.
6. SPLICES FOR ALL STEEL MEMBERS NOTED AS "CONTINUOUS" SHALL OCCUR OVER SUPPORTING MEMBERS.
7. PROVIDE ADEQUATE SEPARATION BETWEEN STRUCTURAL STEEL AND ALUMINUM AND OTHER DISSIMILAR METALS TO PREVENT GALVANIC CORROSION. SEPARATION MATERIALS SHALL BE ADEQUATE TO TRANSFER LOADS.
8. ALL STEEL WHICH IS PERMANENTLY EXPOSED TO NORMAL VIEW BY PEDESTRIANS OR OCCUPANTS SHALL BE CLASSIFIED AS ARCHITECTURALLY EXPOSED STRUCTRUAL STEEL (AESS) AS DEFINED BY THE AISC CODE OF STANDARD PRACTICE.
9. SEE ARCHITECTURAL DRAWINGS FOR FIREPROOFING REQUIREMENTS.

GALVANIZING

1. GALVANIZING OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE FOLLOWING PUBLICATIONS:

   AMERICAN GALVANIZERS ASSOCIATION:

   SUGGESTED SPECIFICATION FOR HOT DIP GALVANIZING

   AMERICAN SOCIETY FOR TESTING AND MATERIALS:

   ASTM A 123 — ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS
   ASTM A 153 — ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE
2. ALL STRUCTURAL STEEL MATERIALS AND ACCESSORIES WHICH ARE HOT-DIP GALVANIZED SHALL MEET SPECIFIED SPECIAL MATERIAL REQUIREMENTS.
3. THE FOLLOWING ITEMS SHALL BE GALVANIZED:
   - A. ALL STEEL MATERIAL THAT EITHER SUPPORTS OR IS BUILT INTO EXTERIOR EXPOSED MASONRY CONSTRUCTION, IS OUTSIDE THE BUILDING THERMAL AND MOISTURE BARRIERS, OR IS EXPOSED TO EXTERIOR WEATHER CONDITIONS.
   - B. ALL CONNECTION MATERIALS FOR GALVANIZED MEMBERS AND FOR PRECAST CONCRETE. CONNECTION MATERIALS SHALL INCLUDE, BUT NOT BE LIMITED TO, NUTS, BOLTS, WASHERS, ANCHOR BOLTS, AND ITEMS EMBEDDED IN CONCRETE.
   - C. ITEMS NOTED ON DRAWINGS TO BE GALVANIZED.
4. GALVANIZED STEEL SHALL BE WELDED IN ACCORDANCE WITH AWS D19 - WELDING ZINC COATED STEEL BY THE AMERICAN WELDING SOCIETY. STEEL SURFACES SHALL BE FREE OF ZINC IN THE AREA TO BE WELDED.
5. AFTER GALVANIZED MATERIALS ARE INSTALLED, REPAIR DAMAGE AND EXTEND GALVANIZIED COATING WITH SPECIFIED ZINC TOUCH-UP MATERIAL TO PROVIDE THE FULL SPECIFIED EXTENT OF ZINC COATING COVERAGE.
6. GALVANIZED COATING SHALL BE REPAIRED BY CLEANING SURFACE, POWER DISC SANDING TO BRIGHT METAL, AND APPLYING AN ORGANIC COLD GALVANIZING COMPOUND WITH A MINIMUM OF 94% ZINC DUST IN THE DRY FILM, 8 MILS MINIMUM DFT, THREE COATS MINIMUM.

LIGHT GAUGE METAL FRAMING

1. ALL LIGHT STRUCTURAL STEEL MEMBERS THAT SUPPORT ROOF AND / OR FLOOR LOADS SHALL BE FORMED FROM STEEL SECTIONS THAT CONFORM TO THE SPECIFICATIONS OF THE STEEL STUD MANUFACTURERS ASSOCIATION (SSMA).
2. ALL LIGHT STRUCTURAL STEEL MEMBERS SHALL HAVE A MINIMUM Fy = 33 KSI.
3. 8" STRUCTURAL WALL STUDS SHALL BE EQUAL TO SSMA DESIGNATION 800S162-43, SPACED AT 16" C/C, U.O.N., WITH GROSS PROPERTIES EQUAL TO: A = 0.537 IN2, Ix = 4.633 IN4, Sx = 1.158 IN3, Iy = 0.160 IN4, Rx = 2.937 IN, Ry = 0.546 IN.
4. 3 1/2" STRUCTURAL WALL STUDS SHALL BE EQUAL TO SSMA DESIGNATION 350S162-54, SPACED AT 16" C/C U.O.N., WITH GROSS PROPERTIES EQUAL TO: A = 0.258 IN2, Ix = 0.508 IN4, Sx = 0.290 IN3, Iy = 0.098 IN4, Rx = 1.404 IN, Ry = 0.617 IN.
5. FURNISH AND INSTALL CONTINUOUS MECHANICAL LATERAL BRACING AT 48" ON CENTER.
6. SUBMIT COPIES OF MANUFACTURER'S DATA INDICATING WALL STUD / TRACK PROPERTIES AND BRACING.
7. SEE ARCHITECTURAL DRAWINGS FOR NON-LOAD BEARING METAL STUDS FRAMING.

WOOD TRUSSES

1. ROOF TRUSSES SHALL BE DESIGNED BY THE TRUSS MANUFACTURER IN ACCORDANCE WITH THE GEOMETRY, SUPPORT LOCATION, AND LOAD INFORMATION SHOWN ON THE DRAWINGS. MEMBER DESIGNS SHALL BE IN ACCORDANCE WITH THE "NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION" BY THE NATIONAL FOREST PRODUCTS ASSOCIATION, AND CONNECTION DESIGNS SHALL BE IN ACCORDANCE WITH THE "TRUSS PLATE INSTITUTE DESIGN SPECIFICATIONS". WOOD TRUSS SHOP DRAWINGS SHALL SHOW COMPLETE CONSTRUCTION INFORMATION AND SHALL BEAR THE SEAL OF A QUALIFIED STRUCTURAL ENGINEER REGISTERED IN NORTH CAROLINA. SEE SPECIFICATION 061753 FOR SUBMITTAL REQUIREMENTS.
2. WOOD TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH THE GRAVITY AND WIND LOADING INFORMATION CONTAINED IN THESE DRAWINGS, AND IN ACCORDANCE WITH ALL APPLICABLE PROVISIONS OF THE "NORTH CAROLINA STATE BUILDING CODE".
3. TOP AND BOTTOM CHORD MEMBERS SHALL BE FABRICATED FROM KILN-DRIED YELLOW PINE, NO. 2 GRADE OR BETTER. WEB MEMBERS SHALL BE FABRICATED FROM KILN-DRIED YELLOW PINE, NO. 2 GRADE OR BETTER.
4. PROVIDE TEMPORARY AND PERMANENT TRUSS BRACING IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE TRUSS PLATE INSTITUTE STANDARD BWT-76 "BRACING WOOD TRUSSES", AND IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS.

FRAMING LUMBER & SHEATHING

1. FRAMING LUMBER, INCLUDING WALL STUDS, SHALL CONFORM TO SPIB NUMBER 2 SOUTHERN YELLOW PINE UNLESS OTHERWISE NOTED.
2. ROOF 3/4" APA RATED SHEATHING, EXPOSURE 1. SECURE TO SUPPORTING WOOD FRAMING WITH 10d NAILS @ 6" C/C @ PANEL EDGES AND 10d NAILS @ 12" C/C AT PANEL INTERIOR SUPPORTS. ALLOW 1/8" SPACE BETWEEN PANEL ENDS AND EDGES TYP.
3. WALL SHEATHING SHALL BE 19/32" APA RATED SHEATHING, EXPOSURE 1. SECURE TO SUPPORTING WOOD FRAMING WITH 10d NAILS @ 6" C/C @ PANEL EDGES AND 10d NAILS @ 12" C/C AT PANEL INTERIOR SUPPORTS. ALLOW 1/8" SPACE BETWEEN PANEL ENDS AND EDGES TYP.
4. ALL LUMBER SHALL BE PROTECTED FROM MOISTURE, HEAT AND DAMAGE DURING DELIVERY, STORAGE AND ERECTION.
5. FURNISH AND INSTALL 2x4 BLOCKING AT ROOF HIPS FOR SUPPORT OF SHEATHING.
6. FURNISH AND INSTALL 2x4 FRAMING AROUND EACH ROOF OPENING U.O.N. ON THE DRAWINGS.
7. LAMINATED VENEER LUMBER (LVL) (MICRO-LAM, G-P LAM, ETC.) SHALL HAVE A MINIMUM MODULUS OF ELASTICITY, E = 1.9 X 106 P.S.I. AND A MINIMUM BENDING STRESS, Fb = 2600 P.S.I.
8. PARALLEL STRAND LUMBER (PSL) (PARALLAMS) SHALL HAVE A MINIMUM MODULUS OF ELASTICITY, E = 2.0 X 106 P.S.I. AND A MINIMUM BENDING STRESS, Fb = 2900 P.S.I.
9. LAMINATED STRAND LUMBER (LSL) SHALL HAVE A MINIMUM MODULAUS OF ELASTICITY, E = 1.3 X 106 P.S.I. AND A MINIMUM BENDING STRESS, Fb = 1700 P.S.I. IN BEAM ORIENTATION
10. ALL EXTERIOR WOOD FRAMING AND FRAMING IN CONTACT WITH MASNORY SHALL BE PRESSURE TREATED FOR PERMINATE EXTERIOR EXPOSURE, UNLESS NOTED OTHERWISE ON DRAWINGS.

ADHESIVE ANCHOR INSTALLATION NOTES

1. THREADED RODS SHALL BE ASTM A193, GRADE B7, UNLESS NOTED OTHERWISE.
2. ALL SURFACES WHICH WILL CONTACT ADHESIVE SHALL BE CLEAN AND FREE OF OIL OR GREASE.
3. ACCURATELY MARK THE SURFACE THAT WILL RECEIVE THE NEW ANCHORS WITH THE LOCATION SHOWN IN THE CONNECTION DETAIL.
4. DRILL HOLES USING EQUIPMENT AND PROCEDURES SPECIFIED BY THE ADHESIVE MANUFACTURER. HOLES SHALL BE DRILLED AT A 90 DEGREE ANGLE FROM FACE OF THE MEMBER.
5. HOLES SHALL BE THOROUGHLY CLEANED OF ALL DUST, LOOSE PARTICLES, AND OTHER BOND INHIBITING MATERIALS. BLOW HOLES CLEAN USING OIL-FREE COMPRESSED AIR. CLEAN EACH HOLE WITH A BRUSH AND REPEAT CLEANING WITH COMPRESSED AIR.
6. STORE, HANDLE, MIX, AND INSTALL ADHESIVE IN STRICT ACCORDANCE WITH THE MANUFACTURER'S PRINTED SPECIFICATIONS AND INSTRUCTIONS, AND THE REQUIREMENTS OF THE CONTRACT DOCUMENTS.
   - A. ANCHORS SET IN SOLID MATERIAL SHALL USE ONE OF THE FOLLOWING ADHESIVE MATERIALS:
     - (1) HILTI HIT RE 500 EPOXY
     - (2) SIMPSON SET EPOXY
     - (3) POWER-FAST+ STANDARD SET EPOXY
   - B. ANCHORS SET IN HOLLOW MATERIAL SHALL USE ONE OF THE FOLLOWING ADHESIVE MATERIALS AND THE MANUFACTURER'S CORRESPONDING SCREEN TUBE INSERT:
     - (1) HILTI HIT HY 20
     - (2) SIMPSON SET EPOXY
     - (3) POWER-FAST+ STANDARD SET EPOXY
7. INJECT THE PREPARED ADHESIVE INTO HOLE (OR SCREEN TUBE) PER MANUFACTURER'S INSTRUCTIONS. SLOWLY INSERT THE ANCHOR INTO THE HOLE IN ONE CONTINUOUS STROKE WHILE ROTATING ONE FULL REVOLUTION. THE ANCHOR SHALL NOT BE MOVED BACK AND FORTH, AS THIS WILL ENTRAP AIR, AS DOES EXCESSIVE ROTATION. INJECT ADDITIONAL ADHESIVE AS REQUIRED TO FILL VOID AROUND ANCHOR.
8. EXCESSIVE HEAT WILL DAMAGE THE ADHESIVE MATERIAL. PROTECT ADHESIVE FROM HEAT OF CUTTING AND WELDING.
9. DO NOT INSTALL NUTS AND WASHERS ON THREADED ROD ANCHORS UNTIL ADHESIVE IS FULLY CURED PER MANUFACTURER'S INSTRUCTIONS. TORQUE NUT PER THE MANUFACTURER'S INSTRUCTIONS, BUT DO NOT EXCEED THE MAXIMUM RECOMMENDED TORQUE.
10. AFTER ADHESIVE HAS FULLY CURED, INSTALL WASHERS AND NUTS ON THREADED ROD ANCHORS AS REQUIRED AND TIGHTEN EACH NUT. DO NOT EXCEED THE MAX. TORQUE SPECIFIED BY THE ADHESIVE MANUFACTURER. ALL NUTS SHALL BE RETORQUED WITHIN 24 TO 72 HOURS AFTER INITIAL TORQUING. DO NOT TORQUE NUTS NOTED TO BE FINGER TIGHT.

DRAWINGS & COORDINATION

1. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS, AND DRAWINGS OF OTHER TRADES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR SEEING THAT THE WORK OF ALL TRADES IS COORDINATED WITH THE STRUCTURAL WORK.
2. CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL DIMENSIONS SHOWN ON THE CONTRACT DOCUMENTS.
3. ANYTHING WHICH, IN THE OPINION OF THE CONTRACTOR, APPEARS TO BE DEFICIENCIES, OMISSIONS, CONTRADICTIONS OR AMBIGUITIES IN THE PLANS OR SPECIFICATIONS, SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGNER. CORRECTIONS OR WRITTEN INTERPRETATIONS SHALL BE ISSUED BEFORE CONSTRUCTION OF THE AFFECTED WORK MAY PROCEED.
4. DETAILS ARE MARKED AT THE SPECIFIC LOCATION WHERE THEY APPLY, BUT ALSO INDICATE GENERAL CONSTRUCTION REQUIREMENTS FOR OTHER LOCATIONS WITH SIMILAR CONDITIONS.
5. DETAILS NOTED AS "TYPICAL" MAY NOT BE REFERENCED ON THE DRAWINGS. TYPICAL DETAILS APPLY AT ALL LOCATIONS WHERE THE TYPE OF CONSTRUCTION SHOWN IN THE TYPICAL DETAIL OCCURS.

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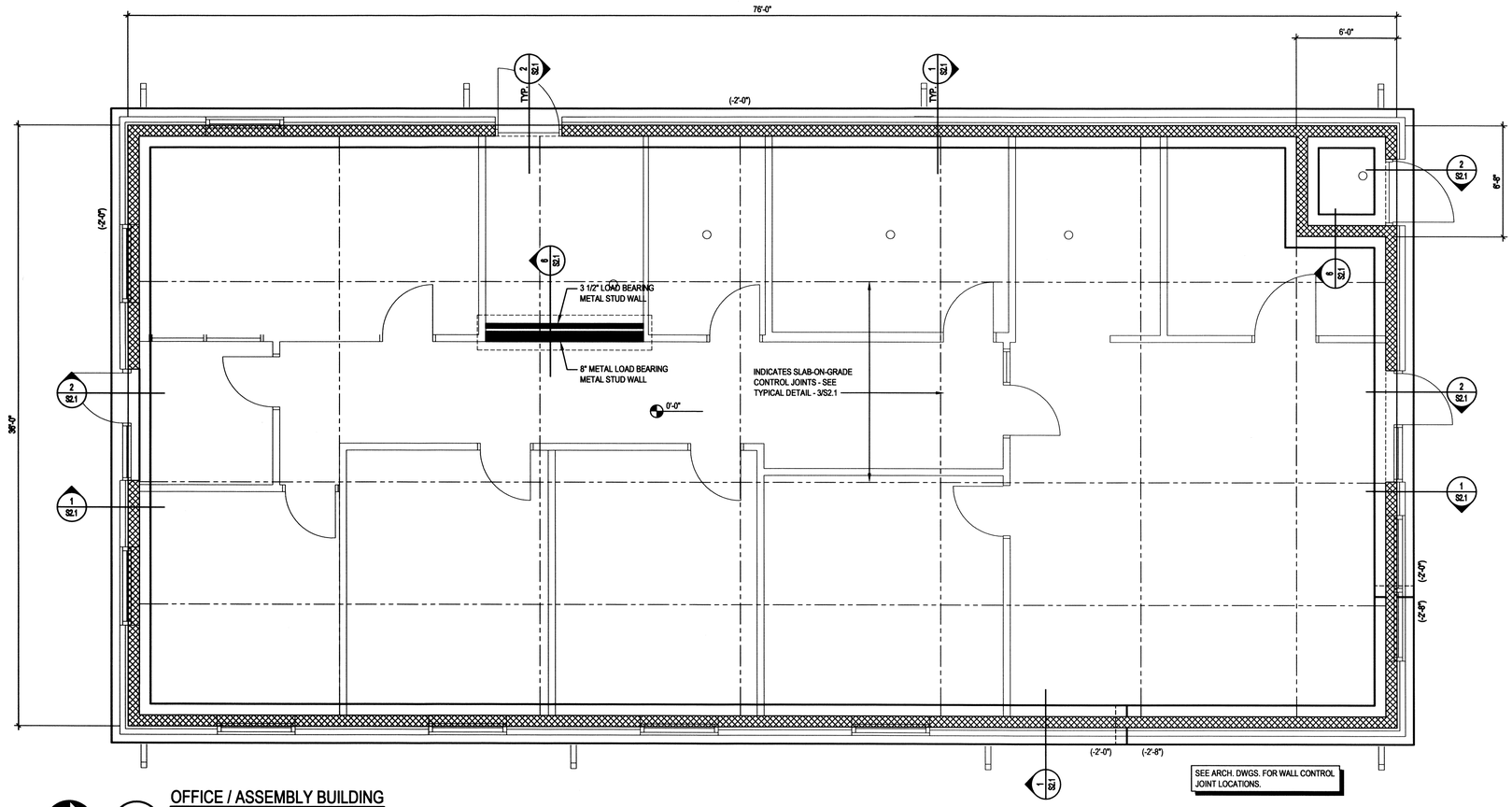

PLAN NORTH

1 S1.1

OFFICE / ASSEMBLY BUILDING FOUNDATION PLAN

1/4" = 1'-0"

Dwg.# 150534-S2001.DWG

FOUNDATION PLAN NOTES

1. ELEVATIONS:
   - A. THE REFERENCE ELEVATION (0'-0") FOR ALL ELEVATIONS SHOWN ON THE FOUNDATION PLANS SHALL BE AT THE TOP OF THE FLOOR SLAB. SEE SITE PLAN FOR SPECIFIED ELEVATION OF THE FLOOR SLAB.
   - B. THE FOLLOWING SYMBOLS ARE USED ON THE FOUNDATION PLANS TO NOTE ELEVATIONS ABOVE (+) OR BELOW (-) THE REFERENCE ELEVATION DEFINED ABOVE.
     - (...) TOP OF FOOTING
     - TOP OF SLAB
     - FOOTING STEP - SEE 4/S2.1
2. SEE ARCHITECTURAL AND CIVIL DRAWINGS FOR EXTERIOR CONCRETE PADS, DRIVEWAYS, AND SIDEWALKS NOT SHOWN ON THIS DRAWING.
3. WALL PROJECTIONS, CHASES, PIERS, AND SIMILAR DETAIL ITEMS MAY NOT BE SHOWN; SEE ARCHITECTURAL DRAWINGS FOR THESE ITEMS.
4. FOOTING ELEVATIONS SHOWN ON PLAN ARE FOR ESTIMATING PURPOSES AND MAY BE VARIED TO SUIT SITE, SOIL, OR UNDERGROUND UTILITY CONDITIONS AS FOLLOWS:
   - A. THE TOP OF ALL EXTERIOR FOOTINGS ARE TO BE A MINIMUM OF 2'-0" BELOW THE FINISH GRADE, COORDINATE WITH SITE PLAN. IN NO CASE SHALL TOP OF FOOTING ELEVATIONS BE HIGHER THAN INDICATED ON PLAN. PRIOR TO CONSTRUCTION, NOTIFY THE ENGINEER OF ALL FOOTING ELEVATIONS THAT VARY FROM THOSE SHOWN ON THE PLAN.
   - B. COORDINATE FOOTING ELEVATIONS WITH UNDERGROUND UTILITIES. UNDERGROUND UTILITIES WHICH CROSS WALL FOOTINGS SHALL CROSS AT AN ANGLE OF NO MORE THAN 45 DEGRESS FROM PERPENDICULAR. UNLESS OTHERWISE SHOWN OR APPROVED BY THE DESIGNER, THE MINIMUM CLEARANCE OF UNDERGROUND PIPES AND UTILITIES WHICH CROSS BELOW WALL FOOTINGS SHALL BE 8", OTHERWISE THE FOOTING SHALL BE STEPPED DOWN SO THAT THE PIPES MAY PASS ABOVE THE FOOTING AND THROUGH THE WALL. ANY PIPES WHICH MUST PASS UNDERNEATH A WALL FOOTING ARE TO BE INSTALLED PRIOR TO THE CONSTRUCTION OF THE FOOTING AND THE TRENCH BACKFILLED AND COMPACTED AS REQUIRED.
   - C. UNLESS OTHERWISE APPROVED BY THE DESIGNER, NO EXCAVATION SHALL OCCUR BELOW A SPREAD FOOTING WITHIN A ZONE DEFINED BY A PLANE SLOPING DOWNWARD AT A 1:1 SLOPE FROM THE BOTTOM EDGES OF THE FOOTING ON ALL SIDES.
5. ALL FOOTING REINFORCING SHALL BE SUPPORTED ON THE SPECIFIED CHAIRS ON THE SOIL AND SHALL BE SECURED AGAINST MOVEMENT DURING CONCRETE PLACEMENT.
6. IF RAINFALL OR GROUNDWATER INTRUSION IS IMMINENT BEFORE PLACEMENT OF CONCRETE IN FOOTING EXCAVATIONS, A 2" THICK "MUD MAT" OF LEAN CONCRETE SHALL BE PLACED IN THE EXCAVATION AFTER OVEREXCAVATING 2" IN DEPTH. FOR LIGHT PRECIPITATION CONDITIONS, PROTECT BOTTOM AND SIDES OF EXCAVATION WITH TEMPORARY 6 MIL POLYETHYLENE LINING. ANY SOIL WHICH IS SOFTENED DUE TO MOISTURE EXPOSURE SHALL BE UNDERCUT TO FIRM SOIL AND THE DEPTH OF THE FOOTING SHALL BE INCREASED TO REPLACE THE SOFT SOIL THAT WAS REMOVED.
7. UNLESS OTHERWISE NOTED, THE CONCRETE SLAB-ON-GRADE SHALL COMPLY WITH THE FOLLOWING:

THICKNESS:	OFFICE BUILDING = 4"; STORAGE BUILDING = 6"
REINFORCING:	4" SLAB = W.W.F. 6x6x2.9x2.9 1" CLR. FROM TOP; 6" SLAB = #3 @14" O/C E.W. 1" CLR. FROM TOP
VAPOR BARRIER:	SEE SPECIFICATIONS
STONE BASE:	6" COMPACTED AGGREGATE BASE COURSE

8. SLAB ON GRADE CONTROL JOINTS:
   - A. SLAB CONSTRUCTION JOINTS SHALL BE LOCATED AT INDICATED CONTROL JOINT LOCATIONS. ALL CONSTRUCTION JOINTS SHALL HAVE DOWELS.
   - B. COORDINATE ALL SLAB JOINT LOCATIONS WITH JOINTS IN ARCHITECTURAL FLOOR FINISHES TO ASSURE THAT ALIGNMENT IS APPLICABLE.
9. SLAB DEPRESSIONS: DEPRESSED AREAS ARE SHOWN ON THE PLAN FOR ESTIMATING PURPOSES ONLY. LOCATIONS AND DEPTHS OF ALL SLAB DEPRESSIONS SHALL BE DETERMINED IN ACCORDANCE WITH ARCHITECTURAL DRAWINGS.
10. SLAB SLOPES: SEE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF FLOOR DRAINS AND SLOPED SLAB AREAS. SLOPE SURFACE UNIFORMLY TO DRAIN. SLOPED SLABS WHICH POND WATER SHALL BE REPLACED.

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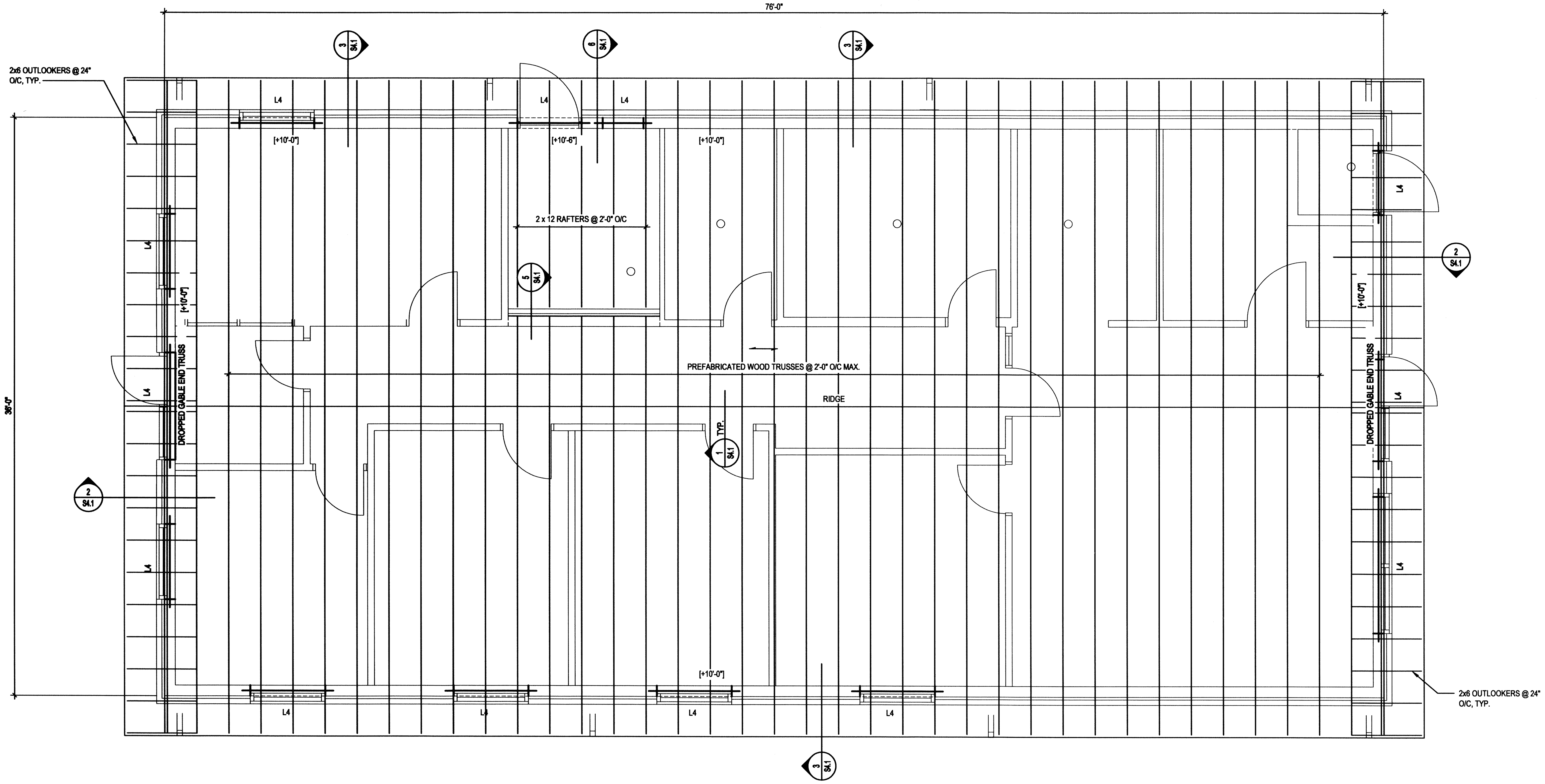


PLAN NORTH

OFFICE / ASSEMBLY BUILDING ROOF FRAMING PLAN

1 / S1.2

1/4" = 1'-0"
Dwg.# 150534-S2002.DWG

ROOF FRAMING PLAN NOTES

1. ELEVATIONS:
   - A. THE REFERENCE ELEVATION (0'-0") FOR ALL ELEVATIONS SHOWN ON THE FLOOR PLANS SHALL BE THE TOP OF THE FLOOR SLAB. SEE SITE PLAN FOR SPECIFIED ELEVATION OF FLOOR SLAB.
   - B. SEE ARCHITECTURAL DRAWING FOR TOP OF WALL / ROOF BEARING ELEVATIONS NOT INDICATED ON STRUCTURAL PLANS.
   - C. THE FOLLOWING SYMBOLS ARE USED ON THE FLOOR PLANS TO NOTE ELEVATIONS ABOVE THE REFERENCE ELEVATION DEFINED ABOVE.

     ⟶ SPAN DIRECTION - ROOF SHEATHING / ROOF DECKING
     LX.... LINTEL - SEE LINTEL SCHEDULE SHEET S1.2
     [X'-X"] INDICATES TOP OF WALL

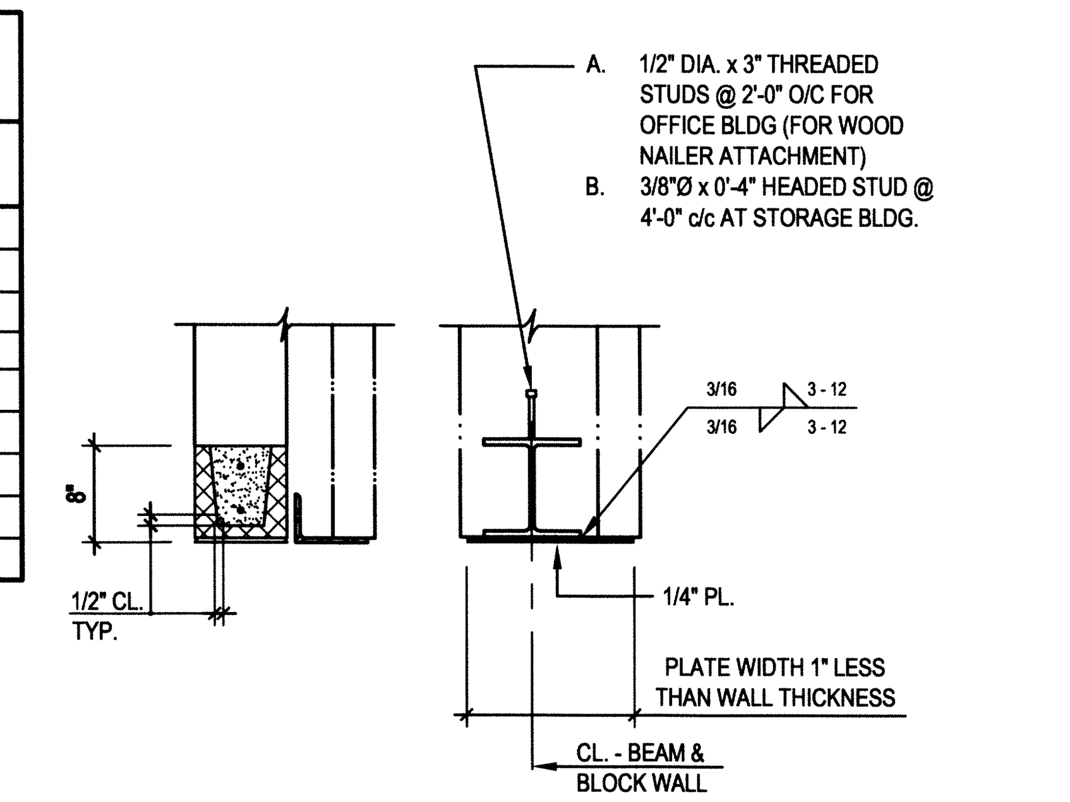
2. SEE ARCHITECTURAL DRAWINGS FOR CEILING RAFTERS NOT NOTED ON STRUCTURAL DRAWINGS.
3. SEE ARCHITECTURAL DRAWINGS FOR TRUSS ROOF SLOPE, TRUSS PROFILES AND ATTIC AREAS.

LINTEL SCHEDULE

MARK	TYPE	MASONRY		STEEL	REMARKS
		SIZE	BARS		
L1	1	8"	2-#4 CONT.	L - 7" x 4" x 3/8" LLH, H.D.G.	
L2	1	8"	2-#4 CONT.	L - 7" x 4" x 3/8" LLH, H.D.G.	
L3	2			W8x24 W/ 1/4" BOTT. PLATE, HD.G. PLATE	
L4	2			W8x15 W/ 1/4" BOTT. PLATE, HD.G. PLATE	

LINTEL NOTES:

1. MECHANICAL / ELECTRICAL / PLUMBING CONTRACTORS SHALL IDENTIFY ALL MECH. OPENINGS IN LOAD BEARING WALLS AND SUPPLY GENERAL CONTRACTOR SIZE AND LOCATION OF OPENINGS PRIOR TO CONSTRUCTION OF WALLS. GENERAL CONTRACTOR SHALL FURNISH AND INSTALL LINTELS. CONTACT STRUCTURAL ENGINEER FOR CLARIFICATION OF LINTEL TYPE IF REQUIRED.
2. INSTALL 2 - 2x6 JACK STUDS AND 1 - 2x6 ADJACENT FULL HEIGHT STUD EACH END OF LINTEL. AT WALL OPENING GREATER THAN 6'-0".
3. INSTALL 3 - 2x6 JACK STUDS AND 2 - 2x6 ADJACENT FULL HEIGHT STUD EACH END OF LINTEL. AT WALL OPENING GREATER THAN 8'-0". U.N.O.
4. SEE ARCH. DWGS. FOR STEEL ANGLE LINTELS REQUIRED TO SUPPORT STONE VENEER ABOVE WALL OPENINGS.
5. MINIMUM MASONRY LINTEL BEARING = 2'-0"
6. FILL CELLS OF BLOCK UNDER LINTEL BEARING w/ GROUT FROM FLOOR TO LINTEL BEARING.
7. FOR MISC. OPENINGS IN MASONRY WALLS NOT SHOWN UP TO 3'-0" USE LINTEL "L1".



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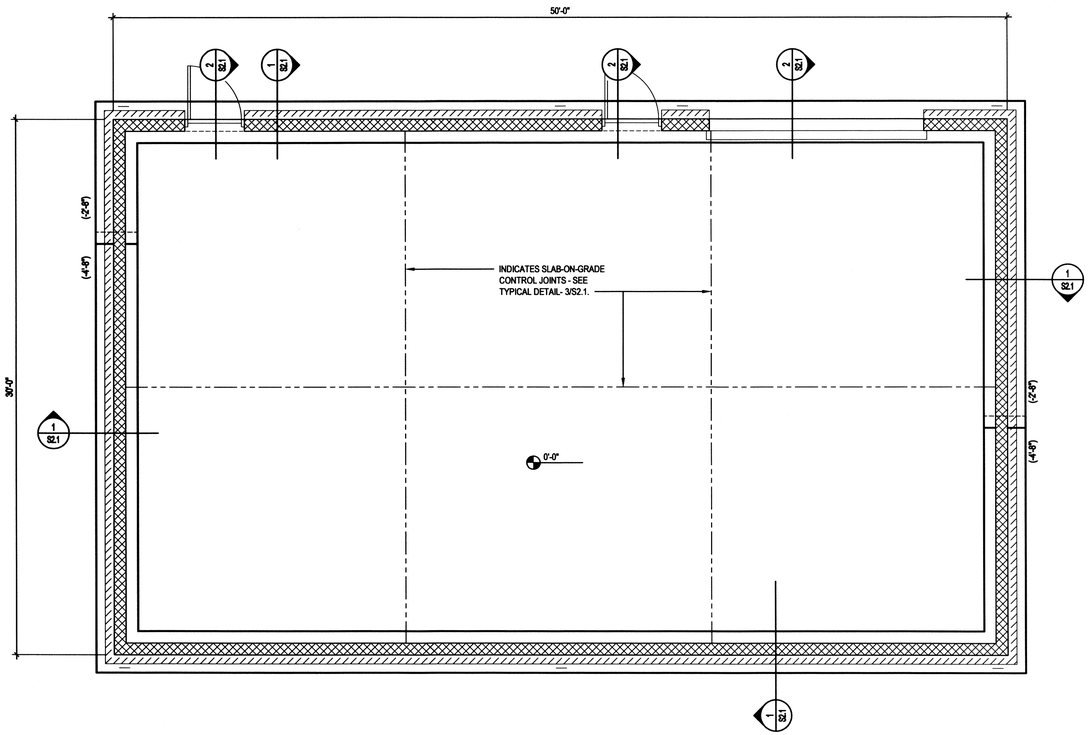


PLAN NORTH

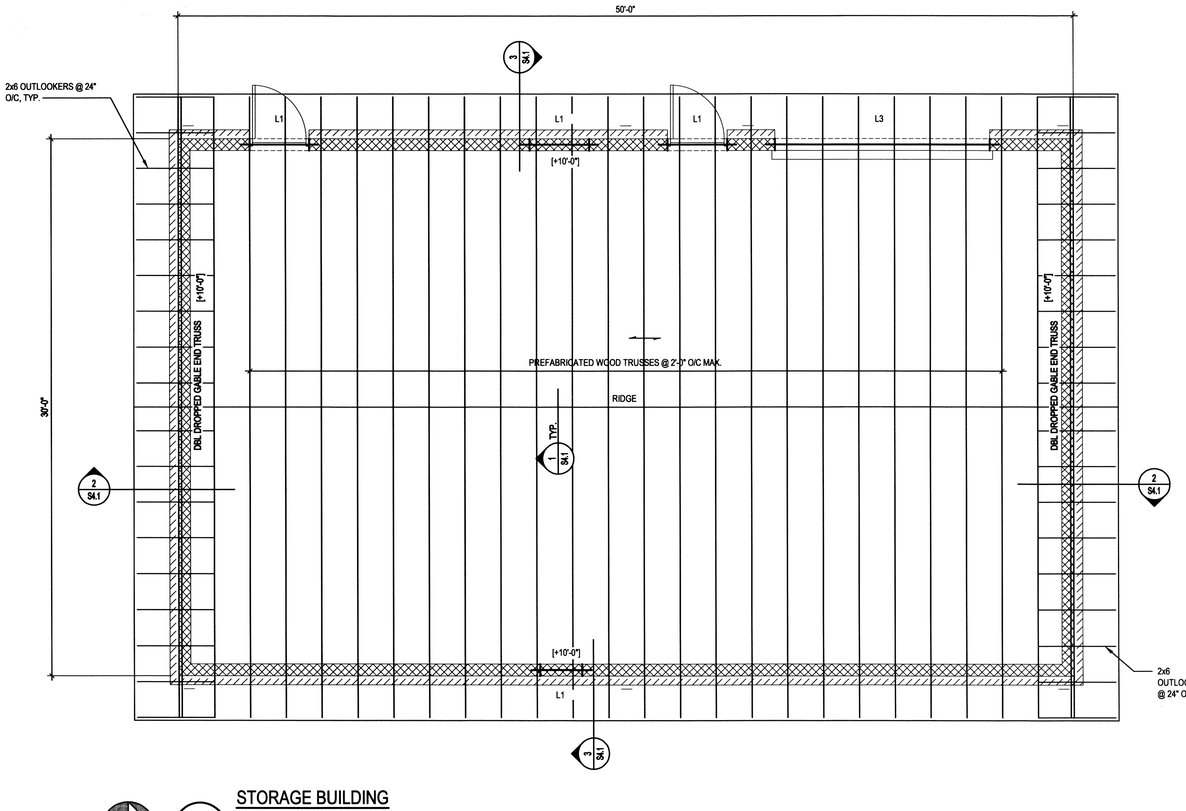
2 / S1.3

STORAGE BUILDING FOUNDATION PLAN

1/4" = 1'-0"

Dwg.# 150534-S2001.DWG

SEE SHEET S1.1 FOR FOUNDATION PLAN NOTES.



PLAN NORTH

2 / S1.3

STORAGE BUILDING ROOF FRAMING PLAN

1/4" = 1'-0"

Dwg.# 150534-S2002.DWG

SEE SHEET S1.2 FOR ROOF FRAMING PLAN NOTES.

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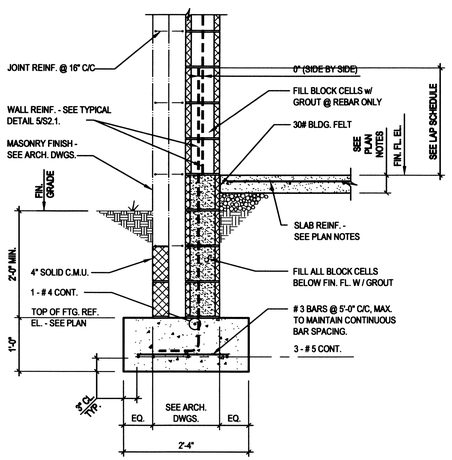
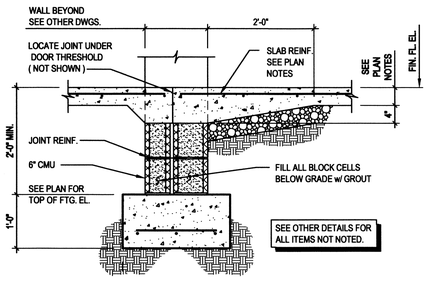


1 S2.1 **SECTION**
3/4" = 1'-0"
Dwg.# 150534-S8001.DWG



2 S2.1 **TYPICAL SECTION AT EXTERIOR DOORS**
3/4" = 1'-0"
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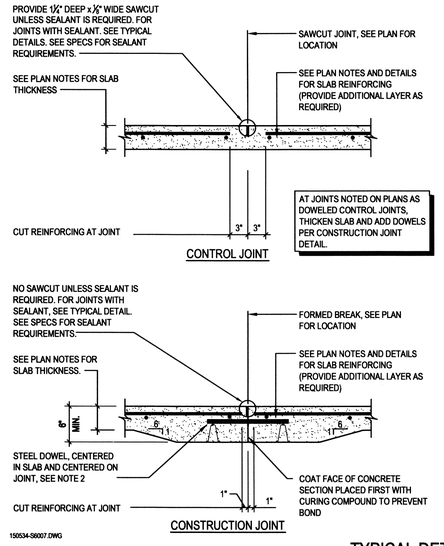


3 S2.1 **TYPICAL DETAIL SLAB ON GRADE JOINTS**
1" = 1'-0"
Dwg.# 150534-S8007.DWG

SLAB-ON-GRADE JOINT NOTES:

1. LOCATE JOINTS IN CONCRETE SLAB AS SHOWN ON FOUNDATION PLAN.
2. SLAB JOINT DOWELS:

   A. PROVIDE 3/4"x 16" SMOOTH ROUND STEEL DOWELS IN SLAB JOINTS SPACED AT 12" O/C DOWELS SHALL BE SAWCUT TO LENGTH.

   B. DOWELS SHALL BE SECURELY SUPPORTED DURING CONCRETE PLACEMENT ON CONTINUOUS SLAB BOLSTERS ON EACH SIDE OF THE JOINT. POSITION AND ALIGN DOWELS TO BE PERPENDICULAR TO THE JOINT AND PARALLEL TO THE TOP SLAB SURFACE.

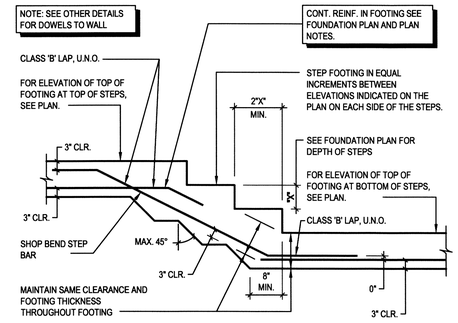
   C. AT CONSTRUCTION JOINT, GREASE END OF DOWEL PLACED IN FIRST SECTION OF CONCRETE. AFTER CONCRETE IN FIRST SECTION HAS HARDENED, MOVE DOWEL BACK AND FORTH IN HOLE TO INSURE THAT BOND IS BROKEN. AT DOWELED CONTROL JOINT, GREASE ENTIRE LENGTH OF DOWEL.

   D. DIAMOND PLATE JOINT KEYS MAY BE USED AS AN ALTERNATIVE TO DOWELS. SUBMIT PRODUCT DATA FOR APPROVAL.
3. SAW CUTTING:

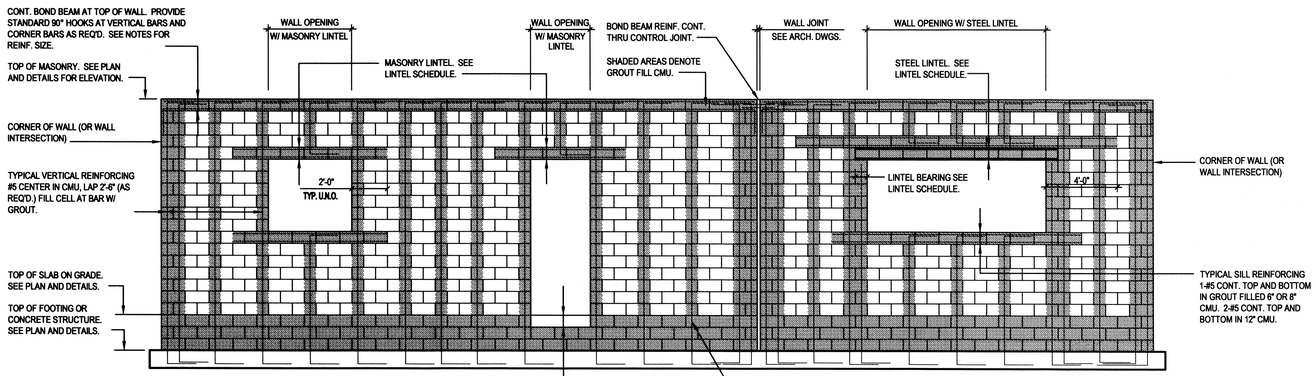
   A. SAWCUT CONTROL JOINTS IMMEDIATELY AFTER COMPLETING SLAB SURFACE FINISHING AT EACH JOINT LOCATION AND AFTER THE CONCRETE IS SUFFICIENTLY SET TO LEAVE NO TRACKS ON THE SURFACE. SAW SHALL BE CAPABLE OF CUTTING OF HARDENED, UNCURED CONCRETE WITHOUT DAMAGING THE CONCRETE.

   B. SAW CUTS AT CONSTRUCTION JOINTS MAY BE MADE WHEN CONTROL JOINTS ARE CUT OR AT ANY TIME PRIOR TO THE TIME THAT JOINT SEALANTS OR FILLERS ARE TO BE INSTALLED.

   C. IMMEDIATELY AFTER SAWCUTTING, CLEAN THE JOINTS AND SLAB SURFACE. CLEANING SHALL REMOVE ALL LAITANCE, SAW DUST, AND OTHER CONTAMINANTS FROM SLAB SURFACE.
4. AFTER SAWING JOINTS AND CLEANING, COMMENCE CURING OF THE SLAB AND JOINTS AS SPECIFIED.



4 S2.1 **TYPICAL DETAIL STEPPED WALL FOOTING**
1/2" = 1'-0"
Dwg.# 150534-S8004.DWG



NOTES:

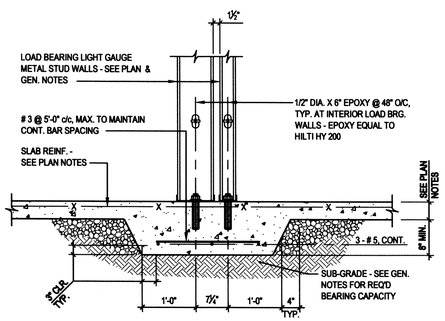
1. BRACE TOP OF ALL MASONRY WALLS AS SHOWN ON OTHER DETAILS.
2. REFER TO DRAWINGS OF OTHER DISCIPLINES FOR ALL OPENING SIZES AND LOCATIONS THROUGH MASONRY WALLS.
3. WHERE DETAILS SHOWN ON OTHER SHEETS NOTE REINFORCING OF GREATER SIZE AND/OR CLOSER SPACING, THE REINFORCING REQUIREMENT IN SAID DETAIL SHALL GOVERN.
4. MINIMUM HORIZONTAL JOINT REINFORCING SHALL BE LADDER TYPE WITH W1.7 WIRES SPACED AT 16"O.C. VERTICAL U.N.O.
5. AT STACKED BOND CONSTRUCTION. PROVIDE CONTINUOUS HORIZONTAL BOND BEAMS AT 4'-0"O.C. MAXIMUM SPACING.
6. WHERE CONTINUOUS 6" OR 8" BOND BEAMS REQUIRED. PROVIDE (1) #5 BAR TOP AND BOTTOM, U.N.O.
7. WHERE CONTINUOUS 12" BOND BEAM REQUIRED PROVIDE (2) #5 BARS TOP AND BOTTOM, U.N.O.
8. PROVIDE CONTINUOUS BOND BEAM AT EVERY 8'-8" HEIGHT OF WALL FOR WALLS GREATER THAN 12'-0" IN HEIGHT.

5 S2.1 **TYPICAL DETAIL - MINIMUM MASONRY WALL REINFORCING**
1/4" = 1'-0"
Dwg.# S1DIM001.DWG

6 S2.1 **TYPICAL DETAIL INTERIOR MASONRY WALL FOOTING**
3/4" = 1'-0"
Dwg.# 150534-S8006.DWG

CONCRETE REINFORCING BAR LAP LENGTH SCHEDULE	
SIZE	CLASS B LAP LENGTH
3	1'-10"
4	2'-6"
5	3'-0"
6	3'-6"
7	5'-3"
8	6'-0"
9	6'-9"

NOTE: SCHEDULE ASSUMES 3000 PSI CONCRETE



6 S2.1 **THICKEN SLAB UNDER LOAD BEARING FRAMED WALLS**
3/4" = 1'-0"
Dwg.# 150534-S8009.DWG

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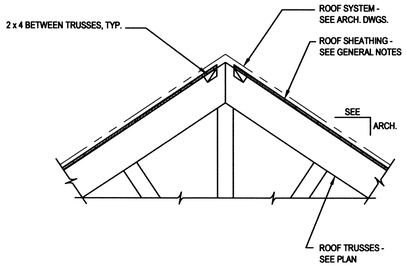
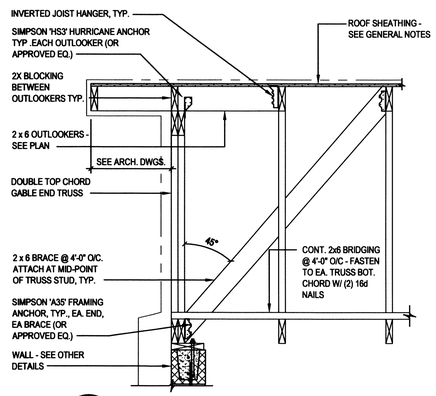


1 S4.1 **TYPICAL DETAIL ROOF SECTION AT RIDGE OF TRUSS**
3/4" = 1'-0"
Dwg.# 150534-S8001.DWG



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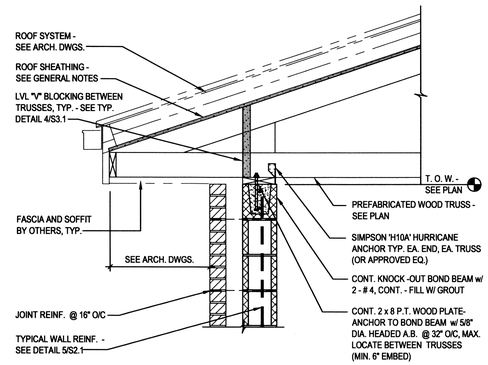

3 S4.1 **SECTION**
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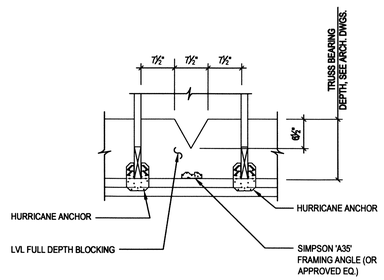
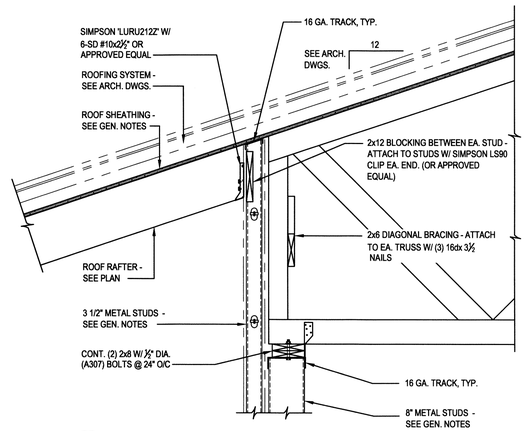
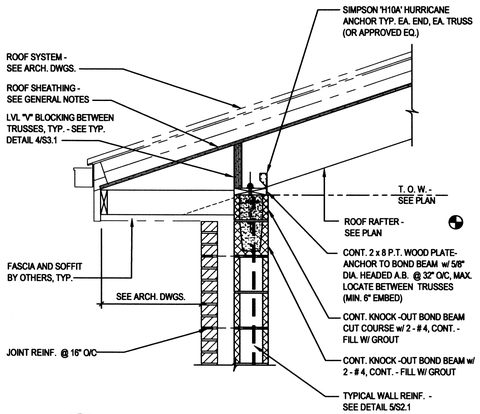


4 S4.1 **TYPICAL "V" NOTCH DETAIL**
3/4" = 1'-0"
Dwg.# 150534-S8004.DWG



5 S4.1 **ROOF SECTION @ MECHANICAL ROOM**
3/4" = 1'-0"
Dwg.# 150534-S8006.DWG



6 S4.1 **SECTION**
3/4" = 1'-0"
Dwg.# 150534-S8007.DWG

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PLUMBING SYSTEMS

PLUMBING GENERAL NOTES

1. Supply piping shall be located above the ceiling, unless noted otherwise. All vertical supply, waste, and vent piping shall be located in walls or partitions, unless noted otherwise.
2. All piping and equipment shall be cleaned of foreign matter then cleaned–out under pressure before the system is put into operation.
3. The Potable Water system shall be Laboratory tested with potable water and shall be proved tight under a water pressure of 125 pounds per square inch for a period of 2 hours. After the system has been tested and approved, the entire new system, including valves and accessories, shall be chlorinated. Disinfecting shall be in accordance with AWWA C651. The waste and vent piping shall be tested with 15psi water and hold for 4 hours. All tests shall be documented in writing.
4. The Contractor shall keep the premises and points at the building free of rubbish and waste material associated with the installation of the work. Remove from the jobsite any materials not economically recoverable. Any materials removed from the jobsite and sold for salvage shall be credited to the Owner's account.
5. All materials used shall be new unless otherwise indicated and shall be furnished in accordance with the standard specification of the American Society for Testing Materials and other industry standard guide specifications.
6. All openings in ceilings, walls, floors and plenums for plumbing pipes shall be sealed airtight.
7. Cleanouts shall have tops designed for specific floor finishes such as carpet, tile, etc., unless noted otherwise. Cleanouts shall be located not more than 50 feet apart for 3" pipe and not more than 80 feet apart for 4" pipe.
8. Verify exact pressure, depth, flow direction, material, connection points, etc., of all existing utilities on job site.
9. Coordinate locations of all equipment, fixtures and piping where necessary to interface components of plumbing with ductwork, lighting, electrical raceways structural and all other trades.
10. Piping run above ceilings shall be run high as possible. The contractor shall do all cutting of walls, floors, and ceilings as required for installation of plumbing work. All cutting shall be held to a minimum. Patch and finish surfaces to match adjoining surfaces. The cutting of openings or holes in walls and cutting of holes in floors and ceilings shall be done in a manner, as not to endanger the stability of the structure and any such work shall be coordinated with other contractors.
11. The project design is based on the first manufacturer indicated on the drawings or the project manual. The Contractor shall bear any costs altering any other contract or subcontract resulting from a substitute of equipment from that specified or on which drawings and specifications are based. When no manufacturer is named, the Contractor may submit any reputable and equal quality manufacturer that meets all codes, criteria and performance requirements of the design documents. If equipment is submitted and accepted with utility connections other than as shown on the drawings and specifications, it shall be the responsibility of the contractor to provide proper utility connections to this equipment at no additional cost.
12. Variation from specified fixture appearance will need to be approved through the architect. The plumbing contractor will be required to coordinate acceptance for variation of fixture locations and fixture configurations with the local building authority, the owner, the architect and the general contractor.
13. Coordinate with the most up–to–date architectural workings drawings before roughing–in plumbing fixtures.
14. The equipment rough–ins as shown are accurate to the best of our knowledge, however, in some instances the owner or supplier may make substitutions or the equipment item may vary from what is shown, therefore the contractor shall verify all critical dimensions prior to construction. Refer to large–scale plans, riser diagrams, and equipment details for vent piping and valving not indicated on the plans. Do not scale drawings. Reference Architectural drawings for final locations of doors, windows, walls, etc.
15. Contractor shall consult Architectural and Structural drawings for all dimensions, ceiling heights, beam depths, location of partitions, kind and number of fixtures or pieces of equipment, structural member locations, etc. Failure of the contractor to verify these dimensions shall place the responsibility for any subsequent relocation directly upon the contractor.
16. The plumbing contractor is to provide instruction to the Owner in the proper operation and maintenance of all equipment and appurtenances provided.
17. These engineering drawings are diagrammatic. It is the intention of these drawings to cover all work and material for a complete first class installation. Make proper hot and cold water, waste, vent, etc. piping connections to all fixtures and equipment, although all fittings and connections are not shown. The plumbing contractor is responsible for providing pipe escutcheons, dielectric unions, drip pans, pipe labels, valve tags, anchors, supports, seals, sleeves, sleeve seals, etc. in quantities adequate to satisfy the intent of the engineer's documents. Any equipment, plumbing fixture, trim hardware and/or devices usually utilized in this class of work, though not specifically mentioned or shown on these drawings, but which may be necessary for the satisfactory completion of the work (as determined by the architect) shall be furnished and installed by the contractor as part of his total work.
18. Plumbing work and plumbing materials shall meet the requirements of the applicable edition of the state plumbing codes. The latest edition of the State Plumbing Building Code is hereby incorporated into and made a part of these documents and the Contractor shall carry out their provisions. Anything contained in these documents that conflicts with the code shall be installed in accordance with the code and such conflicts shall be brought to the attention of the Engineer for clarification. The installation shall meet with local Building Inspection Department approval.

QUALITY ASSURANCE

1. All materials and equipment shall be installed and completed in a first class workmanlike manner. The Owner reserves the right to reject any damaged equipment and to direct the removal and replacement of any items, which in their opinion does not represent acceptable workmanship. Such removal and replacement shall be done when directed by the Owner and without additional cost to the Owner.
2. Plumbing equipment and accessories shall be inspected upon receipt and any damage reported immediately to the carrier and/or manufacturer for warranty services. The Plumbing Contractor shall be responsible to have touch–up or repainted all materials and equipment in his contract with a factory finish if it is observed marred, scratched or defaced at final acceptance of the building by the Owner.
3. The Contractor shall guarantee all materials, equipment and workmanship for a period of 12 months after date of final acceptance of building by the Owner's representative, or for 12 months after occupancy of Owner, or their tenants, should occupancy precede acceptance. All guarantee failures shall be corrected or replaced by the Contractor as soon as possible after notification of such failure.
4. Furnish the Owner with a complete booklet containing equipment engineering data, operating and maintenance instructions, and control wiring diagrams (indicating control equipment and function). In addition, the Contractor shall instruct Owner and/or their representatives on the proper operation and servicing of the equipment.

WATER HEATERS

1. The discharge from the relief valve of the water heater shall be piped full–size of the valve outlet pipe size to a point not more than 2" above the flood level of the pan.
2. Provide a 3" high (24 ga. min.) galvanized pan for each water heater. Pipe the drain pan to outside the building (or to another receptacle approved by the local authority) and terminate 6" to 24" above grade.
3. The plumbing contractor is responsible for coordinating electrical connection points and changes in the electrical requirements with the electrical contractor.
4. The general contractor shall provide and install all structural components required to support the water heater. The plumbing contractor shall provide dimensional requirements to the general contractor as soon as they are available and install all mounting devices supplied by the water heater manufacturer.

PLUMBING FIXTURES

1. Water flow limiting devices will be provided on all plumbing fixtures to meet the maximum allowable water usage for plumbing fixtures as indicated below.

Flush Valve water closet	1.6 gal/flush	
Public lavatories	0.5 gal/min.	(.25 gal/cycle metering type)
Urinal	1.0 gal/flush	

2. Provide accessible trap primers with integral air gaps for each floor drain. Install trap primers in accordance with manufacture application data.

PIPE MATERIALS AND INSTALLATION

WATER PIPING (INTERIOR)
Above Ground:
Type L hard–drawn copper tubing with wrought copper fittings.
ASTM B88–78.
Alternate:
CPVC after water heater where acceptable by code.

SOIL WASTE, VENT AND STORM
Sanitary and Vent:
Hubless Cast Iron and fittings with approved clamps.
ASTM c564–70 and CISPI 301–78.
Alternate:
Schedule 40 PVC where acceptable by code.
Above Ground Storm (sanitary alternate):
Ductile Iron with Mechanical Joints (AWWA c151, class 51).
Joints (ANSI/AWWA c111/a21.11).

NOTE: MATCH SANITARY AND WATER PIPE TYPE WITH EXISITNG WHERE POSSIBLE.

PIPE SIZES

1. See fixture schedule, floor plans, symbol legend, and domestic water riser diagrams for pipe sizing information.
2. See floor plans for building drain and main water service sizes;
3. All piping is sized according to the characteristics of the preferred piping materials. If alternate piping is used then the contractor is responsible for verifying that the velocities are maintained to the original design intent. Provide for allowance for expansion for hot water cpvc.

PIPE HANGERS AND SUPPORTS

1. Place hangers within 12 inches of each horizontal elbow.
2. Use hangers with 1–1/2 inch minimum vertical adjustment. Design hangers for pipe movement without disengagement of supported pipe.
3. Support vertical piping at every floor. Support riser piping independently of connected horizontal piping.
4. Provide hangers adjacent to equipment so the equipment does not support any piping.
5. Support cast iron drainage piping at every joint.

PIPE HANGER SPACING

PIPE MATERIAL	MAXIMUM HANGER SPACING Feet	HANGER ROD DIAMETER Inches
Cast Iron (All Sizes)	5	5/8
Cast Iron (All Sizes) with length of pipe 10 foot	10	5/8
CPVC,1 inch and smaller	3	1/2
CPVC,1–1/4 inches and larger	4	1/2
Copper Tube, 1–1/4 inches and smaller	6	1/2
Copper Tube, 1–1/2 inches and larger	10	1/2
Polypropylene	4	3/8
PVC (All Sizes)	4	3/8

PIPE INSULATION

1. All hot and cold water piping indicated to be run above finished ceilings or in exterior walls shall be installed on the conditioned space side of the building insulation. Insulate all domestic water system pipes above ceilings and on outside walls with R–7 insulation or better.

   Water piping shall not be installed in areas subject to freezing conditions.
   Note: Pipe insulation alone is not considered adequate freeze protection.
2. Insulate all domestic hot water system pipes with 1" of 0.24–0.28 conductivity insulation. Insulation shall have a flame spread rating of not more than 25 and a smoke–developed index of not more than 50.
3. Provide insulation on all exposed piping under fixtures in accordance with ANSI and ADA gudelines.
4. No water piping shall be installed in unconditioned areas.

MAINTAIN PROPER SLOPE FOR INTERIOR AND EXTERIOR PIPE

1. Slopes and invert elevations of exterior sewers, manholes, etc. shall be established and verified, by the plumbing contractor, before any piping is installed so that proper slopes will be maintained and necessary invert elevations obtained.
2. Slopes and invert elevations of all interior pipes shall be established before any piping is installed.
3. Sanitary sewer and storm drainage piping less than 4–inch shall be installed with a minimum slope of 1/4–inch per foot.
4. Domestic Hot and Cold water piping shall be sloped for drainage with drain valves installed at low points. Access panels shall be provided at concealed valves, water hammer arrestors and other devices.

DOMESTIC WATER PUMP SCHEDULE

MARK	SERVICE	GPM	FT. HEAD	RPM	MIN. EFF. (%)	ELECTRICAL MIN. WATTS	ELECTRICAL VOLTS	ELECTRICAL ø	ELECTRICAL CONN. TYPE	MANUFACTURER/ MODEL NO.	REMARKS (NOTES)
RP–D1	DOMESTIC HOT WATER	5	10	2000	60%	175	120	1	–	B&G ECOCIRC XL 55–45	1–5

NOTES:

GENERAL: SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS AND SEQUENCE OF OPERATION. REFER TO "ELECTRICAL CONNECTION TYPE SCHEDULE" FOR WIRING DETAILS.

1. PUMP MANUFACTURER TO VERIFY AND PROVIDE MOTOR HORSEPOWER AS REQUIRED TO PROVIDE SATISFACTORY OPERATION.
2. MANUFACTURER TO PROVIDE PERFORMANCE CURVES INDICATING ALL OPERATING POINTS OF PUMPING SYSTEM.
3. MOTORS SHALL BE NON–OVERLOADING THROUGHOUT THE PUMP CURVE, HIGH EFFICIENCY TYPE, SUITABLE FOR INSTALLATION AS INDICATED.
4. PROVIDE STRAINER. INLET SIZE TO MATCH SYSTEM PIPING. PUMP CONNECTION SIZE TO MATCH PUMP SUCTION SIZE.
5. PROVIDE FACTORY MOUNTED VFD WITH TEMPERATURE SENSOR MOUNTED ON SUCTION SIDE OF PUMP IN RETURN LOOP PIPING.

PLUMBING FIXTURE SCHEDULE

MARK	DESCRIPTION	W.	V.	C.W.	H.W.	REMARKS	NOTES
P–1	WATER CLOSET – BARRIER–FREE	3"	2"	1/2"	---	FLOOR MOUNT, TANK TYPE	1, 2, 3, 5
P–2	LAVATORY – BARRIER–FREE	2"	2"	1/2"	1/2"	COUNTER MOUNTED, WRIST BLADE FAUCET	1, 2, 3, 6
P–3	LAVATORY – BARRIER–FREE	2"	2"	1/2"	1/2"	WALL HUNG, WRIST BLADE FAUCET	1, 2, 3, 6
P–4	SINK– DOUBLEBOWL– COUNTER MOUNTED– PULLOUT FAUCET	1–1/2"	1–1/2"	1/2"	1/2"	DOUBLE BOWL, COUNTER MOUNTED– PULLOUT FACUET	1, 2, 3, 4, 6
P–5	URINAL	1–1/2"	1–1/2"	1/2"	---	–	1, 2, 3, 5
EWC	ELECTRIC WATER COOLER – BI–LEVEL	2"	2"	1/2"	---	WALL MOUNTED – SPLIT BI–LEVEL	1, 2, 3
GG	GUY GREY BOX WITH COLD WATER VALVE	–	–	1/2"	---	WATER CONNECTION BOX FOR ICE MACHINE	–
HB	HOSE BIBB	–	–	3/4"	---	PROVIDE HOSE BIBB WITH WHEEL HANDLE AND ROUGH BRASS FINISH.	–
FPHB	FREEZE PROOF HOSE BIBB	–	–	3/4"	---	PROVIDE ANTI–SIPHON VACUUM BREAKER PROTECTED HOSE BIBB INSTALLED WITH WALL BOX AND LOCKABLE COVER, BOTH WITH ROUGH BRASS FINISH.	–
FD–1	FLOOR DRAIN	3"	2"	–	---	PROVIDE HEAVY–DUTY ENAMEL–COATED CAST IRON BODY FLOOR DRAIN WITH 8" TYPE B SLOTTED SCREW SECURED POLISHED NICKEL BRONZE STRAINER, ADJUSTABLE COLLAR WITH SEEPAGE SLOTS, SEDIMENT BUCKET, AND CAST IRON P–TRAP. PROVIDE ALL 4" FLOOR DRAINS WITH 12" DEEP SUMP RECEIVER BASIN (REFER TO PLANS FOR LOCATIONS).	–
WCO	WALL CLEANOUT (18" ABOVE FINISHED FLOOR)	–	–	–	---	PROVIDE CLEANOUT OF MATERIAL MATCHING THAT OF CONNECTED LINE WITH STAINLESS STEEL WALL PLATE AND ADJUSTABLE HOUSING.	–

NOTES:

1. ROUGH ACCORDING TO ABOVE SCHEDULE UNLESS OTHERWISE INDICATED.
2. HEADERS INDICATED AT FIXTURES TO BE FULL SIZE THEIR ENTIRE LENGTH, FIXTURE CONNECTION TO BE PER SCHEDULE ABOVE.
3. REFER TO ARCHITECTURAL DRAWINGS FOR MOUNTING HEIGHTS.
4. FIXTURE: ELKAY NO. DLR332210, 304 STAINLESS STEEL, NOM. 33"X22"X10–1/8", DOUBLE BOWL SINK, SELF–RIMMING, FULLY UNDERCOATED, 3 HOLE CONFIGURATION.
   FAUCET: AMERICAN STANDARD NO. 4462F, DECK MOUNTED, AERATOR, PULLOUT SPRAYHEAD, CHROME PLATED BRASS.
   TRIM: KOHLER K–7605–P RIGID SUPPLIES WITH LOOSE KEY STOPS, SET SCREW ESCUTCHEONS, AND CHROME NIPPLES. KOHLER J–9000 TRAP WITH JUST J–35FS DRAIN.
   McGUIRE NO. PW–2000–WC INSULATION KIT INCLUDES TRAP, WALL BEND TAIL PIECE, AND SUPPLY COVERS.
5. APPROVED MANUFACTURER: KOHLER, AMERICAN ASTANDARD, GERBER
6. APPROVED MANUFACTURERS: ELKAY, KOHLER, AMERICAN STANDARD
7. APPROVED MANUFACTURERS: KOHLER, CHICAGO FAUCET, MOEN

DIRECT VENT GAS WATER HEATER SCHEDULE

MARK	LOCATION	MODEL No.	CAPACITY GALLONS	RECOVERY AFTER FIRST HOUR	NATURAL GAS REQ'TS	MOUNTING	NOTES
WH–1	MER	BOSCH C950ES	INSTANT	INSTANT	160 MBH	WALL	1–11

NOTES:
1. SET THERMOSTAT AT 120°F DISCHARGE TEMPERATURE.
2. PROVIDE DIRECT VENT KIT.
3. APPROVED MANUFACTURERS: RHEEM, RINNAI
4. CONDENSING TANKLESS WATER HEATER.
5. 120V POWER, 8A, 10A FUSE.
6. DIRECT IGNITION.
7. 3/4" NG, 3/4" HW AND 3/4" CW CONNECTIONS
8. PROVIDE ISOLATION VALVES, WATER FLOW SENSOR, ELECTRONIC WATER CONTROL AND BY–PASS CONTROL.
9. NG: MIN. 4" WC AND MAX 10.5" WC
10. FLOW RATE OF 4.9 GPM.
11. PROVIDE MANUFACTURE'S CONDENSATE NEUTRALIZATION KIT AND DISCHARGE TO FLOOR DRAIN.

PLUMBING LEGEND

EXISTING | NEW WORK

EXISTING	NEW WORK	DESCRIPTION
(E)		DOMESTIC COLD WATER
(E)		DOMESTIC HOT WATER
(E)		DOMESTIC HOT WATER RETURN
(E)		SANITARY
(E)		SANITARY (BELOW SLAB OR GRADE)
(E)		VENT
		PIPE TURNING DOWN
		PIPE TURNING UP
		PIPE CAP
		SHUT–OFF VALVE
		CHECK VALVE
		BALANCING VALVE
		PRESSURE REDUCING/REGULATING VALVE
		STRAINER
		SAFETY OR RELIEF VALVE
	FD	FLOOR DRAIN
		HUB DRAIN
	CO	FLOOR CLEANOUT
	CO	END–OF–LINE CLEANOUT
		WALL CLEANOUT
	P	PUMP
	WH	WALL HYDRANT
	HB	HOSE BIB
	FPHB	FREEZE PROOF HOSE BIB
	TP	TRAP PRIMER
	# #	SPECIFIC OR NEW WORK NOTES
		NEW–TO–EXISTING CONNECTION
		POINT OF DEMOLITION
		EXISTING PIPING TO BE REMOVED

GENERAL LIST – ALL SYMBOLS MAY NOT BE USED.

ABBREVIATIONS

ABV	ABOVE
AFF	ABOVE FINISH FLOOR
AFWH	ANTI–FREEZE WALL HYDRANT
BEL	BELOW
BF	BARRIER FREE
BFF	BELOW FINISH FLOOR
BTUH	BRITISH THERMAL UNIT/HOUR
CO	CLEANOUT
CW	COLD WATER
EX	EXISTING
FCO	FLOOR CLEANOUT
FD	FLOOR DRAIN
FIN	FINISH
FL	FLOOR
HB	HOSE BIBB
HCP	HANDICAP
HW	HOT WATER
HWR	HOT WATER RETURN
INV	INVERT ELEVATION
LAV	LAVATORY
RD	ROOF DRAIN
RL	RAIN LEADER
SA	SHOCK ARRESTOR
SAN	SANITARY
SD	STORM DRAIN (BELOW GRADE)
SS	SERVICE SINK
SW	STORM WATER
T&P	TEMPERATURE AND PRESSURE
TW	TEMPERED WATER
TYP	TYPICAL
UR	URINAL
V	VENT
VB	VACUUM BREAKER
VLV	VALVE
VTR	VENT THRU ROOF
WC	WATER CLOSET
WCO	WALL CLEANOUT
WH	WALL HYDRANT
℄	CENTER LINE
EC	ELECTRICAL CONTRACTOR
GC	GENERAL CONTRACTOR
MC	MECHANICAL CONTRACTOR
PC	PLUMBING CONTRACTOR

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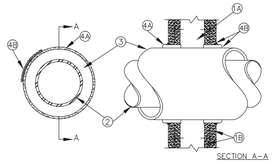
Designed RCC Drawn DAC
Checked RCC Date 10/18/16
Project No. 07002–0002

SYSTEM NO. W-L-5001

MAY 19, 2005

F RATINGS – 1 AND 2 HR (SEE ITEM 1)
T RATINGS – 3/4, 1, AND 1-1/2 HR (SEE ITEM 3)
L RATING AT AMBIENT – 2 CFM PER SQ. FT.
L RATING AT 400°F – LESS THAN 1 CFM PER SQ. FT.



SECTION A-A

1. WALL ASSEMBLY – THE 1 OR 2 HR FIRE-RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. (92 MM) WIDE BY 1-3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

B. GYPSUM BOARD* – NOM 5/8 IN. (16 MM) THICK, 4 FT (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL DESIGN IN THE UL FIRE RESISTANCE DIRECTORY.
MAX DIAM OF OPENING IS 14-1/2 IN. (368 MM) FOR WOOD STUD WALLS AND 18 IN. (457 MM) FOR STEEL STUD WALLS.

THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS 1 HR WHEN INSTALLED IN A 1 HR FIRE RATED WALL AND 2 HR WHEN INSTALLED IN A 2 HR FIRE RATED WALL.

2. THROUGH PENETRANTS – ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:

A. STEEL PIPE – NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

B. COPPER TUBING – NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

C. COPPER PIPE – NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. PIPE COVERING* – NOM 1 OR 2 IN. (25 OR 51 MM) THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF OR 56 KG/M3) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SEALED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT. WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED, THE ANNULAR SPACE BETWEEN THE PIPE COVERING AND THE CIRCULAR CUTOUT IN THE GYPSUM WALLBOARD LAYERS ON EACH SIDE OF THE WALL SHALL BE MIN 1/4 IN. (6 MM) TO MAX 3/8 IN. (10 MM) WHEN NOM 2 IN. (51 MM) THICK PIPE COVERING IS USED, THE ANNULAR SPACE BETWEEN THE PIPE COVERING AND THE CIRCULAR CUTOUT IN THE GYPSUM BOARD LAYERS ON EACH SIDE OF THE WALL SHALL BE MIN 1/4 IN. (6 MM) TO MAX 3/8 IN. (19 MM)

SEE PIPE AND EQUIPMENT COVERING MATERIALS (BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS 3/4 HR WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS 1 HR AND 1-1/2 HR WHEN NOM 2 IN. (52 MM) THICK PIPE COVERING IS USED WITH 1 HR AND 2 HR FIRE RATED WALLS, RESPECTIVELY.

4. FIRESTOP SYSTEM – INSTALLED SYMMETRICALLY ON BOTH SIDES OF WALL ASSEMBLY. THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

A. FILL, VOID OR CAVITY MATERIALS* – WRAP STRIP – NOM 1/4 IN. (6 MM) THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. (51 MM) WIDE STRIPS. NOM 2 IN. (51 MM) WIDE STRIP TIGHTLY WRAPPED AROUND PIPE COVERING (FOIL SIDE OUT) WITH SEAM BUTTED. WRAP STRIP LAYER SECURELY BOUND WITH STEEL WIRE OR ALUMINUM FOIL TAPE AND SLID INTO ANNULAR SPACE APPROX 1-1/4 IN. (32 MM) SUCH THAT APPROX 3/4 IN. (19 MM) OF THE WRAP STRIP WIDTH PROTRUDES FROM THE WALL SURFACE. ONE LAYER OF WRAP STRIP IS REQUIRED WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED. TWO LAYERS OF WRAP STRIP ARE REQUIRED WHEN NOM 2 IN. (51 MM) THICK PIPE COVERING IS USED.

3M COMPANY – FS-195+

B. FILL, VOID OR CAVITY MATERIALS* – CAULK OR SEALANT – MIN 1/4 IN (6 MM) DIAM CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED EDGE OF THE WRAP STRIP LAYER APPROX 3/4 IN. (19 MM) FROM THE WALL SURFACE.

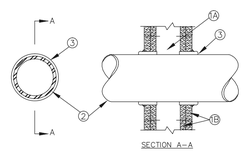
3M COMPANY– CP 25WB+, IC 15WB+, FIREDAM 150+ CAULK OR FB-3000 WT SEALANT

* BEARING THE UL CLASSIFICATION MARK.

SYSTEM NO. W-L-1001

JUNE 15, 2005

F RATINGS – 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)
T RATINGS – 0, 1, 2, 3 AND 4 HR (SEE ITEM 3)
L RATING AT AMBIENT – LESS THAN 1 CFM PER SQ. FT.
L RATING AT 400°F – LESS THAN 1 CFM PER SQ. FT.



SECTION A-A

1. WALL ASSEMBLY – THE 1, 2, 3 OR 4 HR FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 H FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. (92 MM) WIDE BY 1-3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

B. GYPSUM BOARD* – NOM 1/2 OR 5/8 IN. (13 OR 16 MM) THICK, 4 FT. (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 26 IN. (660 MM).

2. THROUGH-PENETRANT – ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. / (0 MM). (POINT CONTACT) TO MAX 2 IN. (51 MM) PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

A. STEEL PIPE -– NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

B. IRON PIPE – NOM 24 IN. (610 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.

C. CONDUIT – NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.

D. COPPER TUBING – NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

E. COPPER PIPE – NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

F. THROUGH PENETRATING PRODUCT* – FLEXIBLE METAL PIPING THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:

1. NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

OMEGA FLEX INC

2. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

TITEFLEX CORP A BUNDY CO

3. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

WARD MFG INC

3. FILL, VOID OR CAVITY MATERIAL* – CAULK OR SEALANT– MIN 5/8, 1-1/4, 1-7/8 AND 2-1/2 IN. (16, 32, 48 AND 64 MM) THICKNESS OF CAULK FOR 1, 2, 3 AND 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW:

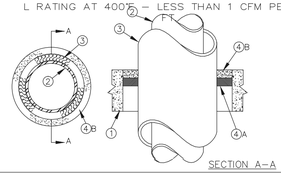
MAX PIPE OR CONDUIT DIAM IN (MM)	F RATING HR.	T RATING HR
1 (25)	1 OR 2	0+, 1 OR 2
1 (25)	3 OR 4	3 OR 4
4 (102)	1 OR 2	0
6 (152)	3 OR 4	0
12 (305)	1 OR 2	0

+ WHEN COPPER PIPE IS USED, T RATING IS 0 H.
3M COMPANY – CP 25WB+ OR FB-3000 WT.
* BEARING THE UL CLASSIFICATION MARK.

SYSTEM NO. C-AJ-5001

MARCH 05, 2007

F RATINGS – 1-1/2, 2 AND 3 HR (SEE ITEM 4)
T RATINGS – 0, 1/2, 3/4 AND 1 HR (SEE ITEMS 1A AND 4)
L RATING AT AMBIENT – 2 CFM PER SQ. FT.
L RATING AT 400°F – LESS THAN 1 CFM PER SQ. FT.



SECTION A-A

1. FLOOR OR WALL ASSEMBLY – MIN 2-1/2 IN. (64 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100-150 PCF OR 1600-2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 18 IN. (457 MM).

SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

1A. STEEL SLEEVE – (OPTIONAL, NOT SHOWN) – NOM 10 IN. (254 MM) (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY. SLEEVE MAY EXTEND A MAX OF 2 IN. (51 MM) ABOVE TOP OF FLOOR OR BEYOND EITHER SURFACE OF WALL. T RATING IS 0 HR WHEN SLEEVE IS USED.

2. THROUGH PENETRANT – NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE OR NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE CENTERED IN THE OPENING AND RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY.

3. PIPE COVERING* – NOM 1/2 TO 2 IN. (13 TO 51 MM) THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF OR 56 KG/M3) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY-APPLIED SELF-SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT.

SEE PIPE AND EQUIPMENT COVERING – MATERIALS* (BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. FIRESTOP SYSTEM – THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

A. PACKING MATERIAL – MIN 1 IN. (25 MM) THICKNESS OF FIRMLY PACKED MINERAL WOOL BATT INSULATION USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR SLEEVE OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF CAULK FILL MATERIAL (ITEM B).

B. FILL, VOID OR CAVITY MATERIAL* – CAULK OR SEALANT – APPLIED TO FILL THE ANNULAR SPACE FLUSH WITH THE TOP SURFACE OF THE FLOOR OR SLEEVE OR FLUSH WITH BOTH SURFACES OF WALL. WHEN NOM PIPE COVERING THICKNESS IS 2 IN. (51 MM), MIN THICKNESS OF CAULK FILL MATERIAL IS 2 IN. (51 MM). WHEN NOM PIPE COVERING THICKNESS IS 1-1/2 IN. (38 MM) OR LESS, MIN THICKNESS OF CAULK FILL MATERIAL IS 1 IN. (25 MM). THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE DEPENDENT UPON THE THICKNESS OF THE FLOOR OR WALL, THE SIZE OF PIPE, THE THICKNESS OF PIPE COVERING MATERIAL AND THE SIZE OF THE ANNULAR SPACE (BETWEEN THE PIPE COVERING MATERIAL AND THE EDGE OF THE CIRCULAR THROUGH OPENING) AS SHOWN IN THE FOLLOWING TABLE:

MIN FLOOR OR WALL THKNS, IN.	MAX PIPE DIAM, IN.	NOM PIPE COVERING THKNS, IN.	ANNULAR SPACE IN.	F RATING HR.	T RATING HR.
2-1/2 (64)	4 (102)	1 or 1-1/2 (25 or 38)	1/2 to 2-3/8 (13 to 60)	2	1
4-1/2 (114)	4 (102)	2 (51)	1/4 to 3-5/8 (6 to 92)	2	1-1/2
2-1/2 (64)	12 (305)	1 (25)	1/2 to 1-1/2 (13 to 38)	2	1/2
4-1/2 (114)	12 (305)	1 (25)	1/2 to 2-3/8 (13 to 60)	3	1
2-1/2 (64)	12 (305)	1/2 (13)	1/2 to 2-3/8 (13 to 60)	2	0

3M COMPANY – CP 25WB+ or FB-3000 WT

* BEARING THE UL CLASSIFICATION MARK.

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Checked RCC Date 10/18/16
Project No. 07002-0002

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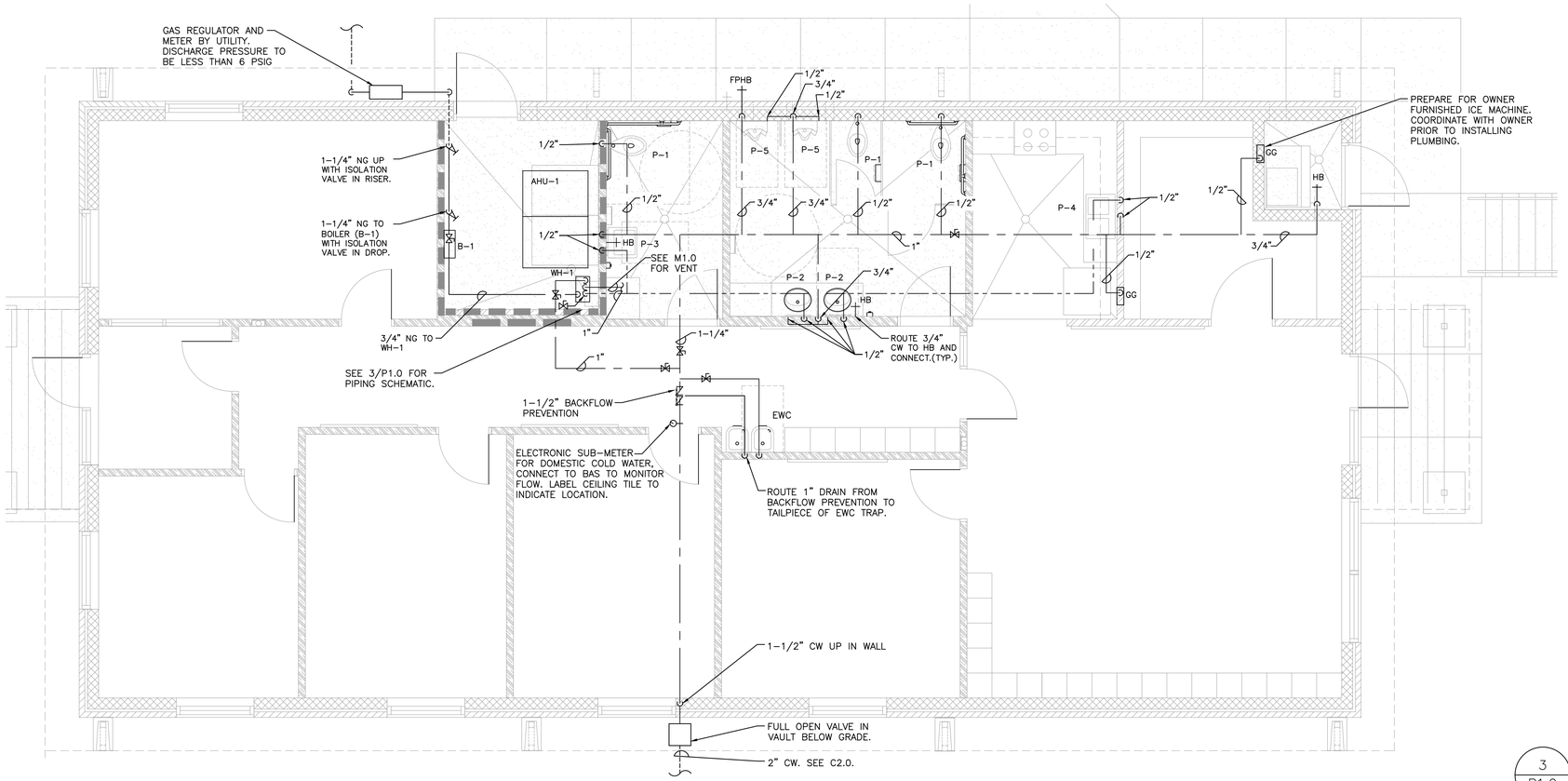
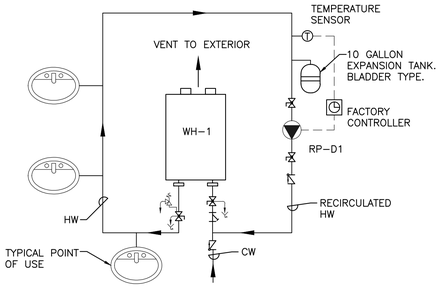


1 P1.0 PLUMBING DOMESTIC WATER- NEW WORK

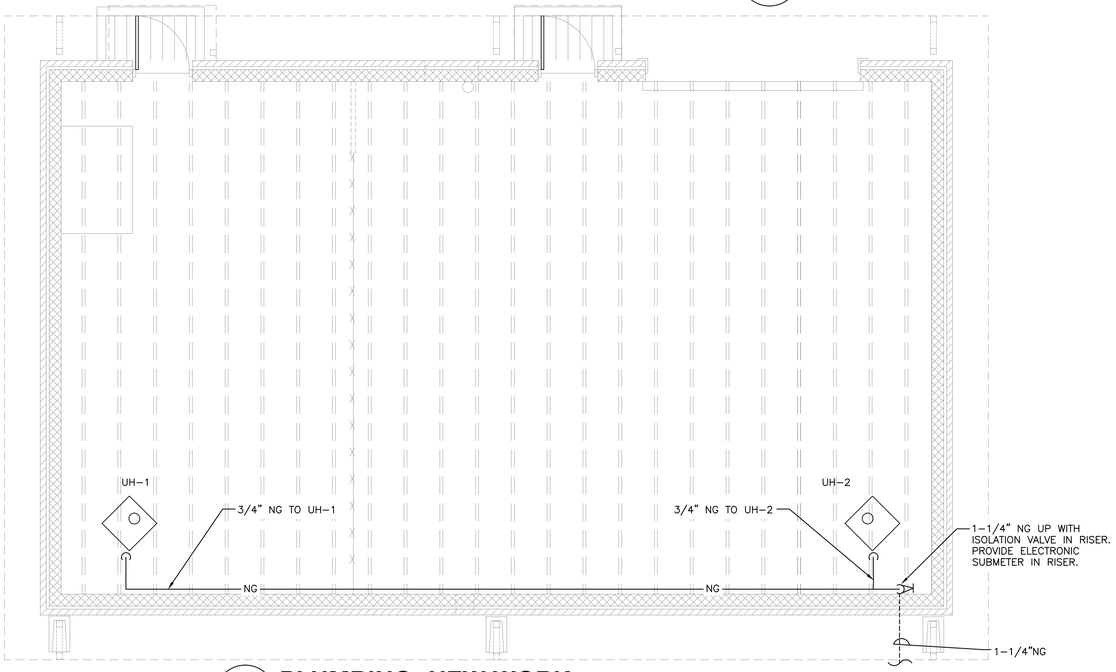
SCALE : 1/4" = 1'-0"

NATURAL GAS LOADS	
OFFICE BUILDING	
B-1	136MBH
WH-1	160MBH
	296MBH
STORAGE SHED	
UH-1	150MBH
UH-2	150MBH
	300MBH



3 P1.0 DOMESTIC HOT WATER SCHEMATIC

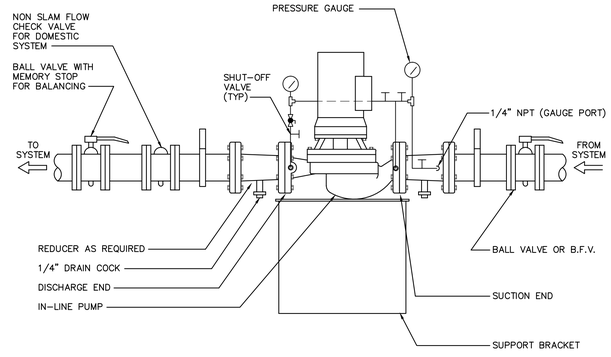
SCALE : NTS



2 P1.0 PLUMBING- NEW WORK

SCALE : 1/4" = 1'-0"

NOTE:
ALL DOMESTIC WATER PIPING IS ROUTED BETWEEN BOTTOM OF CORD OF ROOF TRUSS AND CEILING ON THE CONDITIONED SIDE OF THE ATTIC INSULATION.



4 P1.0 INLINE CIRCULATION PUMP DETAIL (RP-D1)

SCALE : NTS

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Checked RCC Date 10/18/16
Project No. 07002-0002

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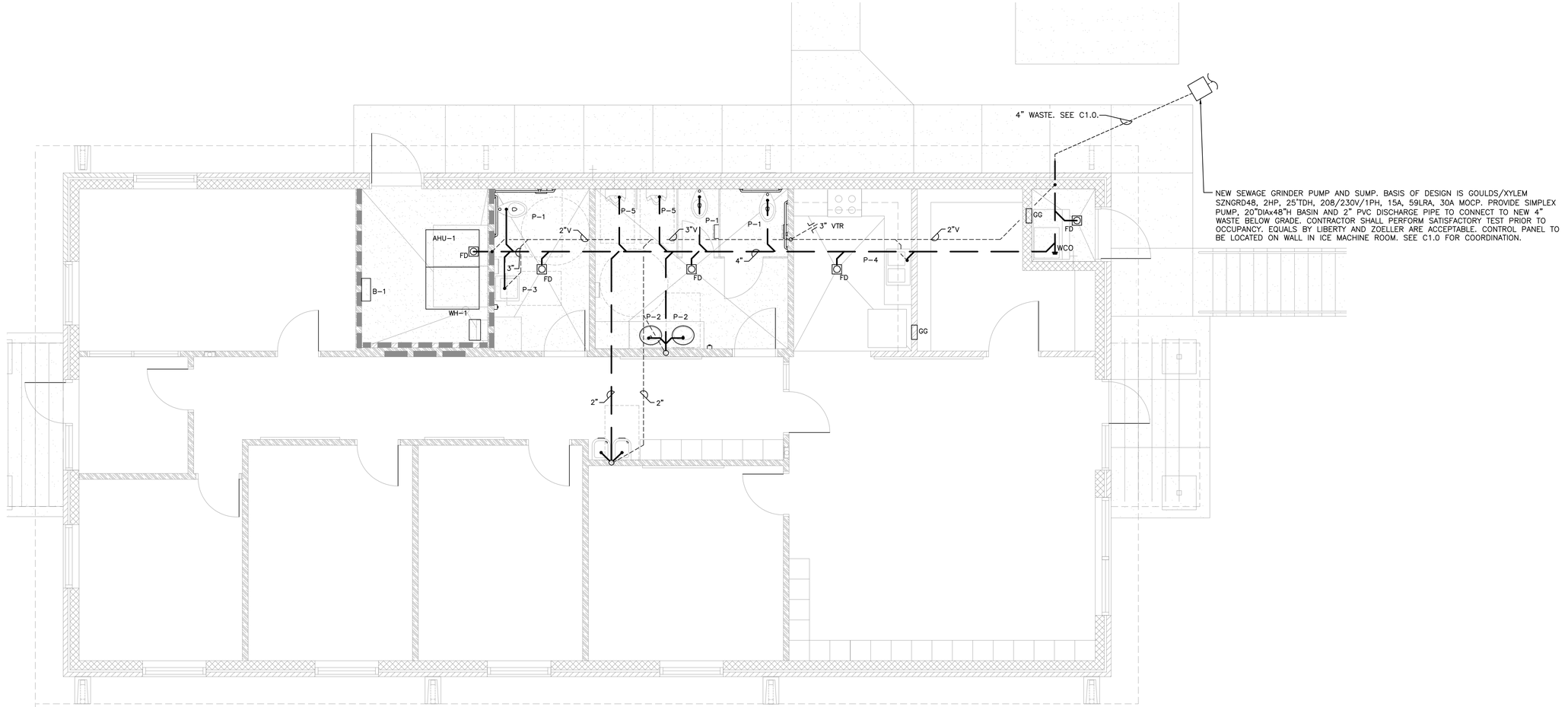

1 P1.1 **PLUMBING WASTE AND VENT- NEW WORK**

SCALE : 1/4" = 1'-0"

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Checked RCC Date 10/18/16
Project No. 07002-0002

HVAC LEGEND

DUCTWORK SYMBOLS

- RISE IN ELEVATION OF HORIZONTAL DUCTWORK IN DIRECTION OF AIRFLOW
- DROP IN ELEVATION OF HORIZONTAL DUCTWORK IN DIRECTION OF AIRFLOW
- (M) MOTOR OPERATED DAMPER (MOD) W/ACCESS DOOR
- MANUAL VOLUME DAMPER (MVD)
- (S) MOTOR OPERATED SMOKE DAMPER W/ACCESS DOOR
- [S] DUCT MOUNTED SMOKE DETECTOR WITH ACCESS DOOR
- VERTICAL FIRE DAMPER W/ACCESS DOOR
- HORIZONTAL FIRE DAMPER W/ACCESS DOOR
- (S) COMBINATION VERTICAL FIRE DAMPER/SMOKE DAMPER WITH ACCESS DOOR
- (S) COMBINATION HORIZ. FIRE DAMPER/SMOKE DAMPER WITH ACCESS DOOR
- AD ACCESS DEVICE. – SEE SPECIFICATIONS
- SUPPLY OR OA DUCT – TURNING UP
- RETURN/EXHAUST/RELIEF DUCT TURNING UP
- SUPPLY OR OA DUCT TURNING DOWN
- RETURN/EXHAUST/RELIEF DUCT TURNING DOWN
- STOP DUCT LINER HERE (LINER TO BE USED TOWARD SHADED SIDE OF DIAMOND)
- 8"ø FLEXIBLE DUCT
- FLEXIBLE DUCT CONNECTION
- EXISTING DUCT TO REMAIN
- EXISTING DUCT TO BE REMOVED

NOTES:
1. ALL DUCT DIMENSIONS SHOWN ARE IN INCHES AND ARE FREE AREA SIZES UNLESS OTHERWISE SHOWN.

SINGLE LINE DUCTWORK

- MEDIUM OR HIGH PRESSURE SUPPLY
- LOW PRESSURE SUPPLY
- RA RETURN AIR
- EA EXHAUST AIR
- RFA RELIEF AIR
- OA OUTSIDE AIR
- EX EXISTING DUCTWORK TO REMAIN
- EX EXISTING DUCTWORK TO BE REMOVED
- SUPPLY DIFFUSER
- EXHAUST OR RETURN GRILLE OR REGISTER
- U.L. RADIATION DAMPER
- DUCT TRANSITION OR REDUCER
- 8"ø FLEXIBLE DUCT
- DUCT DROP
- DUCT RISE
- (M) MOTOR OPERATED DAMPER (MOD) W/ACCESS DOOR
- MANUAL VOLUME DAMPER (MVD)
- (S) MOTOR OPERATED SMOKE DAMPER W/ACCESS DOOR
- [S] DUCT MOUNTED SMOKE DETECTOR WITH ACCESS DOOR
- VERTICAL FIRE DAMPER W/ACCESS DOOR
- HORIZONTAL FIRE DAMPER W/ACCESS DOOR
- (S) COMBINATION VERTICAL FIRE DAMPER/SMOKE DAMPER WITH ACCESS DOOR
- (S) COMBINATION HORIZ. FIRE DAMPER/SMOKE DAMPER WITH ACCESS DOOR

MISCELLANEOUS SYMBOLS AND ABBREVIATIONS

- A) OA INTAKE
- B) RELIEF
- C) EXHAUST OUTLET
- D) EXHAUST FAN
- CEILING MOUNTED EXHAUST FAN
- CONNECT TO EXISTING
- POINT OF DEMOLITION
- $ SWITCH
- $TOS TIMED OVERRIDE SWITCH
- $ESS EMERGENCY STOP SWITCH
- (H)2 HUMIDISTAT OR HUM. INDICATOR; SUBSCRIPT INDICATES ITEM SERVED
- (HS) HUMIDITY SENSOR
- (T)2 THERMOSTAT OR TEMP. INDICATOR; SUBSCRIPT INDICATES ITEM SERVED
- (T)N NIGHT LOW LIMIT THERMOSTAT
- (TS) TEMPERATURE SENSOR

AFF	ABOVE FINISH FLOOR
AHU	AIR HANDLING UNIT
AAV	AUTOMATIC AIR VENT
BFF	BELOW FINISHED FLOOR
℄	CENTER LINE
EF	EXHAUST FAN
ERU	ENERGY RECOVERY UNIT
ESP	EXTERNAL STATIC PRESSURE
FCU	FAN COIL UNIT
EC	ELECTRICAL CONTRACTOR
GC	GENERAL CONTRACTOR
MC	MECHANICAL CONTRACTOR
PC	PLUMBING CONTRACTOR
HPDA	HIGH PRESSURE DRIP APPARATUS
LPDA	LOW PRESSURE DRIP APPARATUS
MPDA	MEDIUM PRESSURE DRIP APPARATUS
MAF	MAKE-UP AIR FAN
MAV	MANUAL AIR VENT
EA	EXHAUST AIR
OA	OUTSIDE AIR
RA	RETURN AIR
RFA	RELIEF AIR
SA	SUPPLY AIR
RF	RETURN FAN
SF	SUPPLY FAN
RTU	ROOF TOP AIR HANDLING UNIT
SPF	STAIR PRESSURIZATION FAN
TSP	TOTAL STATIC PRESSURE
UH	UNIT HEATER
UV	UNIT VENTILATOR
VP	VELOCITY PRESSURE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN

- #/##/#–## DETAIL OR SECTION NUMBER
- SHEET ON WHICH DETAIL OR SECTION APPEARS
- SHEET ON WHICH DETAIL OR SECTION IS CUT
- DG CFM DOOR GRILLE BY G.C.
- UC CFM UNDERCUT DOOR BY G.C.
- # SPECIFIC OR NEW WORK NOTES
- # REVISION NOTES
- # DEMOLITION NOTES:
- PLENUM OR DUCT TEMP. & PRESSURE CHECK POINT (3/4" FLANGE AND NIPPLE WITH CAP).
- 21x12 RECTANGULAR DUCT
- 21x12 FLAT-OVAL DUCT
- 12ø ROUND DUCT
- A 12x12 400 3W — DEVICE TYPE, NECK SIZE, CFM, FLOW PATTERN — GRILLE, REGISTER OR DIFFUSER DESIGNATION
- EX EXISTING
- EX EXISTING GRILLE, REGISTER OR DIFFUSER

GENERAL NOTE: ALL ITEMS IN LEGEND MAY NOT BE REQUIRED ON THIS PROJECT

MECHANICAL SYSTEMS

HVAC GENERAL NOTES

1. The HVAC Contractor is to provide all labor, equipment and materials for a complete heating, air conditioning and exhaust air systems as indicated with the Engineer's design documents.

   This shall include (not limited to) the following:

   A. Air Distribution System
   B. Refrigerant Piping and Valves
   C. Sheet Metal Ductwork
   D. Flexible Ductwork
   E. Insulation
   F. Hangers
   G. Controls

2. Do not scale drawings. See architectural drawings and reflected ceiling plan for exact location of doors, windows, ceiling diffusers, etc. Contractor shall consult Architectural, Electrical, Plumbing and Structural drawings for all dimensions, ceiling heights, beam depths, location of partitions, kind and number of fixtures or pieces of equipment, structural member locations, etc.
3. Locate all thermostats 48" above the finished floor, unless otherwise noted.
4. Provide and install manual balancing dampers in ductwork five feet upstream of all ducted diffusers. If five feet cannot be maintained then the maximum distance possible should be observed. The Contractor shall also provide and install all dampers necessary to balance the system to the airflow values shown on plans.
5. Provide and install fire and/or smoke dampers where indicated on plans and in such locations as required by applicable code. Installation of fire and/or smoke dampers shall be in strict accordance with the damper manufacturer recommendation.
6. The latest edition of the Heating and Air Conditioning Building Code is hereby incorporated into and made a part of these documents and the Contractor shall carry out their provisions. Anything contained in these documents that conflicts with the code shall be installed in accordance with the code and such conflicts shall be brought to the attention of the Engineer for clarification. The Installation shall also meet the local Building Inspection Department approval.
7. It is the intention of these drawings to cover all work for a complete first class mechanical installation. Any equipment, trim hardware and/or devices usually utilized in the class of work, though not specifically mentioned or shown on the drawings, but which may be necessary for the satisfactory completion of the work (as determined by the Architect) shall be furnished and installed by the HVAC Contractor as part of his total work.
8. The Contractor shall examine the site and be familiarized with all existing conditions as is required to enable him to carry out installation. The Contractor's failure to comply with this requirement will not relieve him of the responsibility of any errors, which might have been avoided by his compliance.
9. Contractor shall coordinate his work and the installation of his work with the other Contractors and should any condition arise where the work of this Contractor shall interfere with, or prevent proper and satisfactory installation, the Contractor shall be responsible for working out such problems to allow proper installation. Should such interference involve changes in the plans and/or specifications, the Contractor shall notify the Architect and Engineer in writing before proceeding with changes. Ductwork shall take precedence over any conflicting piping in same area.
10. The Contractor shall be responsible for all work damaged by him in executing contract. All work damaged by the Contractor shall be replaced by him and placed in normal working condition without extra cost. Any construction work damaged shall be made acceptable to the Architect, Engineer, and Owner. The Contractor shall, at all times, be responsible for any damaged equipment or work in conjunction with executing the contract The HVAC Contractor shall repair, replace, or repaint to match existing surfaces damaged by the HVAC Contractor during installation of mechanical equipment.
11. The cutting of chases, openings or holes in walls and cutting of holes in floors and ceilings shall be done in a manner, as not to endanger the stability of the structure and any such work shall be coordinated with other contractors. All penetrations through fire rated assemblies shall be sealed with a UL listed material that will maintain the integrity of the assembly fire rating.
12. All ductwork and equipment shall be cleaned–out under pressure and cleaned of foreign matter before the system is put into operation.
13. The Contractor shall keep the premises and points at the building free of rubbish and waste material associated with the installation of the work. Remove from the jobsite any materials not economically recoverable. Any materials removed from the jobsite and sold for salvage shall be credited to the Owner's account.
14. Provide equipment, materials, labor and services necessary for complete balancing of all air systems. The Contractor is to install balancing dampers where indicated and otherwise required to properly balance all systems. Any defects indicated by the tests shall be corrected immediately by the Mechanical Contractor without cost to the Owner. The testing and Balancing Contractor, as hired by the MC, shall be fully certified by NEBB and shall have at least one member of the agency qualified as a certified test and Balance Engineer who has been issued this certification by the National Examining Board.
15. All materials used shall be new unless otherwise shown or called for, and shall be furnished in accordance with the standard specification of the American Society for Testing Materials, the American Society of Mechanical Engineers, and other guide specifications.
16. Drawings are based on first manufacturer named on drawings or in specifications. Contractor shall bear any costs altering any other contract or subcontract resulting from a substitute of equipment for that specified or on which drawings and specifications are based. When no manufacturer is named, Contractor may submit any reputable, quality manufacturer that meets all codes, criteria and performance requirements of the design documents.
17. The drawings are diagrammatic and shall be followed as closely as possible. However, the contractors shall be responsible to coordinate their installation and work out interference that might occur among themselves. Should interference occur, the Engineer will assist in working them out in the best interests of all contractors concerned and with as little change in the systems as originally planned as possible. The drawings indicate major offsets but by no means indicate all such situations. Should Contractor elect to prefabricate ductwork or piping, he shall do so at the risk of having to make field changes to avoid structure or other trades at his own expense. Owner, Architect, and Engineer shall not be liable for extra expenses involved because of the Contractor's failure to include adequate allowance in his price for such field problems.
18. All motor driven equipment under this contract shall operate under continuous maximum demands on the respective systems without objectionable noise or vibration in any portion of the system. The Architect and Engineer shall reject any noisy motor driven equipment.
19. All surfaces seen through grilles and diffusers shall be painted black.

ELECTRICAL WORK

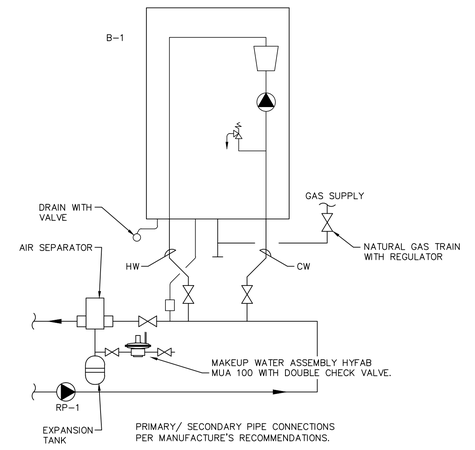
1. The HVAC Contractor shall furnish and install all motors, controls, control wiring, contactors and starters for all equipment in this section of work. Starters and switches shall be best grade Square–D, Westinghouse, G.E. or Allen Bradley rated for motors and conforming to electrical specifications. Provide thermal protection for each motor. Provide only the power wiring specifically called for under each item of equipment. All other power wiring is in the electrical contract. Disconnects not provided by the Electrical Contractor shall be provided by this contractor.
2. Electrical work shall be performed by an approved subcontractor qualified and licensed in electrical work. Raceways, conductors and installation requirements shall conform to the requirements of the N.E.C. and the electrical division requirements of this project. Motor connections at motor terminals shall not be made until rotation, horsepower and phase ratings, and ratings of any required thermal heaters have been verified and approved as correct for the installation.
3. Motors shall be of sufficient size for the duty to be performed and shall not exceed their full rated load when the driven equipment is operated at specified capacity under the most severe conditions likely to be encountered. Motors shall have continuous duty classification based on 40°C ambient temperature.

QUALITY ASSURANCE

1. All materials and equipment shall be installed and completed in a first class workmanlike manner. The Owner reserves the right to reject any damaged equipment and to direct the removal and replacement of any items, which in their opinion, shall not represent acceptable workmanship. Such removal and replacement shall be done when directed by the Owner and without additional cost to the Owner.
2. Mechanical equipment and accessories shall be inspected upon receipt and any damage reported immediately to the carrier and/or manufacturer for warranty services. The HVAC Contractor shall be responsible to have touch–up or repainted all materials and equipment in this contract with a factory finish if it is observed marred, scratched or defaced at final acceptance of the building by the Owner.
3. The Contractor shall guarantee all materials, equipment and workmanship for a period of 12 months after date of final acceptance of building by the Owner's representative, or for 12 months after occupancy of Owner, or their tenants, should occupancy precede acceptance. All guarantee failures shall be corrected or replaced by the Contractor as soon as possible after notification of such failure.
4. Furnish the Owner with a complete booklet containing equipment engineering data, operating and maintenance instructions, control wiring diagrams (indicating control equipment and function). In addition, Contractor shall instruct Owner and/or their representatives on proper operation and servicing of equipment.
5. Provide new factory filters in all air systems as part of the project closeout procedure.

EQUIPMENT NOTES

1. All electrical equipment shall bear the UL approved mark.
2. All HVAC and refrigeration equipment shall comply with the following standards: ASHRAE; ANSI; NFPA 90A; NFPA 90B; and NFPA 214. Manufacture's instructions shall remain attached to each associated appliance in a position to be easily read. All equipment shall be provided with permanent factory labels.
3. Equipment shall be located so as to allow adequate clearance for maintenance and service. Allow sufficient working area for component removal.
4. Exterior mechanical equipment shall be accessible and located with a minimum working clearance of 36 inches on the service side of the unit.
5. Trapped condensate, primary and secondary drain lines, shall be routed independently to a suitable disposable place as approved by the local authority having jurisdiction. Secondary condensate drip should be conspicuous and observable.
6. Outdoor air intakes shall be screened with a corrosion resistant material not larger than ½" mesh and located a minimum of 10 feet away from exhaust or sanitary sewer vent outlets.
7. Provide each air distribution system with a manual control to stop supply fans in an emergency. All ductwork shall comply with SMACNA standards and be tested and labeled in accordance with the requirements of UL 181.



1 M0.1 **PRIMARY/SECONDARY PIPING**
SCALE : NTS

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Designed RCC Drawn DAC
Checked RCC Date 10/18/16
Project No. 07002–0002

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportattion, Raleigh, NC SCO # 141126301A

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TERMINAL UNIT SCHEDULE

MARK	CFM MAX/MIN	E.S.P.	CONTROL TYPE	COOLING COIL TC MBH	COOLING COIL SHC MBH	HEATING COIL MBH (GPM)	HEATING COIL ROWS	MFG./MODEL NO.	UNIT SIZE	NOTES	AREA SERVED
TU-1	250/125	0.2	DDC	6.0	5.0	8.0 (1.0)	1	NAILOR 30RW	6	1,2,3,4	CORRIDOR & MER
TU-2	590/100	0.2	DDC	10.0	8.5	19.0 (1.5)	1	NAILOR 30RW	7	1,2,3,4	TOILETS, BREAK RM, STORAGE
TU-3	750/200	0.2	DDC	18.0	15.0	24.5 (2.0)	2	NAILOR 30RW	8	1,2,3,4	ASSEMBLY
TU-4	300/75	0.2	DDC	7.0	6.0	9.8 (1.0)	2	NAILOR 30RW	6	1,2,3,4	TS OFFICE
TU-5	300/75	0.2	DDC	7.0	6.0	9.8 (1.0)	2	NAILOR 30RW	6	1,2,3,4	TS3 OFFICES
TU-6	290/75	0.2	DDC	5.0	4.0	9.5 (1.0)	2	NAILOR 30RW	6	1,2,3,4	COUNTY ENGINEER
TU-7	420/100	0.2	DDC	14.0	12.0	13.7 (1.0)	2	NAILOR 30RW	7	1,2,3,4	RECEPTION
–	–	–	–	–	–	–	–	–		–	–
–	–	–	–	–	–	–	–	–		–	–

NOTES:
1. PROVIDE DDC THERMOSTAT
2. APPROVED EQUALS BY YORK AND TRANE ARE ACCEPTABLE.
3. HWS= 140°F, HWR= 110°F, COIL ΔT= 30°F
4. MINIMUM BRANCH PIPE SIZE= 3/4"
5. HEATING COIL SIZE BASED ON MAXIMUM AIRFLOW, 30°F DELT T AND SUPPLY AIR TEMPERATURE OF 60°F.

AIR DISTRIBUTION SCHEDULE

MARK	MFG./MODEL	SERVICE	MODULE SIZE	NECK SIZE	DESCRIPTION
A	NAILOR–6500	SUPPLY	24x24	SEE PLAN	LAY–IN CEILING
B	NAILOR–6500	SUPPLY	24x24	SEE PLAN	GYPSUM BOARD
1	NAILOR–5155H	RETURN	24x24	SEE PLAN	LAY–IN CEILING
2	NAILOR–5155H	EXHAUST	24x24	SEE PLAN	GYPSUM BOARD
3	NAILOR–5155H	EXHAUST	12x12	SEE PLAN	SIDEWALL

1. AIR DEVICE SIZE & SCHEDULED AIRFLOW ARE BY THIS SCHEDULE UNLESS OTHERWISE NOTED ON HVAC FLOOR PLANS.
2. MAXIUM PRESSURE DROP FOR ALL AIR DEVICES SHALL NOT EXCEED 0.10 IN. W.G.
3. MAXIMUM NC RATING FOR ALL AIR DEVICES SHALL NOT EXCEED 20 NC.
4. ALL AIR DEVICES SHALL BE WHITE UNLESS OTHERWISE NOTED.
5. ALL AIR DEVICES SHALL BE ALUMINUM CONSTRUCTION UNLESS OTHERWISE NOTED.
6. PROVIDE TRANISITION TO DIFFUSER NECK SIZE.
7. 4–WAY LOUVER.

HEATING HOT WATER PUMP SCHEDULE

MARK	SERVICE	GPM	FT. HEAD	RPM	MIN. EFF. (%)	ELECTRICAL MIN. WATTS	ELECTRICAL VOLTS	ELECTRICAL ø	ELECTRICAL	MANUFACTURER/ MODEL NO.	REMARKS (NOTES)
RP–1	HEATING HOT WATER	15	20	3000	60%	175	120	1		B&G ECOCIRC XL 55–45	1–5
–	–	–	–	–	–	–	–	–		–	–

NOTES:

GENERAL: SEE SPECIFICATIONS FOR SPECIFIC REQUIREMENTS AND SEQUENCE OF OPERATION. REFER TO "ELECTRICAL CONNECTION TYPE SCHEDULE" FOR WIRING DETAILS.

1. PUMP MANUFACTURER TO VERIFY AND PROVIDE MOTOR HORSEPOWER AS REQUIRED TO PROVIDE SATISFACTORY OPERATION.
2. MANUFACTURER TO PROVIDE PERFORMANCE CURVES INDICATING ALL OPERATING POINTS OF PUMPING SYSTEM.
3. MOTORS SHALL BE NON–OVERLOADING THROUGHOUT THE PUMP CURVE, HIGH EFFICIENCY TYPE, SUITABLE FOR INSTALLATION AS INDICATED.
4. PROVIDE SUCTION DIFFUSER. INLET SIZE TO MATCH SYSTEM PIPING. PUMP CONNECTION SIZE TO MATCH PUMP SUCTION SIZE.
5. PROVIDE FACTORY MOUNTED VFD WITH TEMPERATURE SENSOR MOUNTED ON SUCTION SIDE OF PUMP IN RETURN LOOP PIPING.

EXHAUST FAN SCHEDULE

MARK	TYPE	SERVICE	CFM	E.S.P. (" W.G.)	ELECTRICAL VOLTS	ELECTRICAL ø	HP	MANUFACTURER/ MODEL NO.	REMARKS (NOTES)
EF–1	CENT	TOILETS	375	0.25"	120	1	1/3	COOK 70SQN–B	1–6,9
EF–2	CENT	MER	200	0.25"	120	1	1/6	COOK 70SQN–B	1–6,9
EF–3	CENT	STORAGE BUILDING	500	0.15"	120	1	1/20	COOK XPD–10	1–4,6,8
EF–4	CENT	ECONOMIZER	2900	1.00"	120	1	1.5	COOK 150 SQN–B	1–4,6,10
EF–5	PROP	ICE ROOM	100	0.1"	120	1	1/80	COOK SWD–8	1–4,6,11

NOTES:
1. PROVIDE U.L. LISTED FACTORY INSTALLED DISCONNECT SWITCH.
2. PROVIDE GRAVITY BACKDRAFT DAMPER
3. PROVIDE BIRDSCREEN.
4. PROVIDE U.L. LABEL.
5. PROVIDE WALL SWITCH.
6. APPROVED EQUALS BY GREENHECK AND BARRY ARE ACCEPTABLE
7. PROVIDE ROOF CURB.
8. PROVIDE HOA WALL SWITCH.
9. PROVIDE ACCESS DOOR TO ALLOW REMOVAL OF UNIT.
10. INTERLOCK WITH AHU–1 FOR ECONOMIZER OPERATION.
11. PROVIDE WITH OSHA WIRE GUARD, WALL COLLAR, AND WEATHER HOOD.

AIR HANDLING UNIT SCHEDULE

TAG	SERVICE	CFM TOTAL AIR	EXTERNAL STATIC PRESSURE	FAN HP	FAN FLA	FAN VOLTS/ø	COOLING TOTAL MBH	COOLING SENS. MBH	ELECTRICAL MCA	MANUFACTURER/ MODEL NUMBER	NOTES
AHU–1	COOLING AND VENTILATION	2900	1.25"	3 HP	15.6	240/3	86.3	64.0	–	TRANE/UCCAF	1–12

NOTES:
1. UNIT SHALL BE EQUIPPED WITH A 1" PLEATED FILTER RACK ASSEMBLY, MERV 11.
2. UNIT SHALL HAVE SINGLE POINT CONNECTION. UNIT MOUNTED DISCONNECT BY M.C. E.C. TO PROVIDE AND INSTALL POWER WIRING COMPLETE TO UNIT MOUNTED DISCONNECT AND TO OUTDOOR UNIT.
3. ROUTE CONDENSATE TO EXTERIOR SPLASH BLOCK
4. UL LISTED WITH UL LABEL
5. MECHANICAL CONTRACTOR SHALL PROVIDE AND INSTALL STRUCTURAL SUPPORTS.
6. AHU FANS SHALL RUN IN ALL OCCUPIED CONDITIONS AND PROVIDED WITH FACTORY PROGRAMMED VFD.
7. PROVIDE WITH DUCT MOUNTED TEMPERATURE SENSORS.
8. MINIMUM OUTDOOR AIR OF 400 CFM. INTERLOCK WITH ER–4 FOR ECONOMIZER OPERATION.
9. RESET DISCHARGE AIR TEMPERATURE TO 60°F WHEN OUTDOOR AIR TEMPERATURE IS BELOW 60°F.
10. DRAIN PAN SHALL BE STAINLESS STEEL WITH FACTORY INSTALLED CONDENSATE OVERFLOW SWITCH.
11. PROVIDE BAS CONNECTIVITY.
12. PROVIDE HOT WATER PRE–HEAT COIL WITH MAXIMUM 3 GPM FLOW. SEE 1/M0.2 FOR COIL FITTINGS FOR 2–WAY CONTROL VALVE.

SPLIT SYSTEM CONDENSING UNIT SCHEDULE

TAG	NOMINAL TONS	COOLING O.A. °F	MCA	VOLTS/ø	CONDENSING FAN QTY	CONDENSING FAN RPM	CONDENSING FAN FLA	MANUFACTURER/ MODEL NUMBER	NOTES
CU–1	7.5	88	34.4	240/3	1	N/A	3.1	TRANE	1–11

NOTES:
1. WIRING: E.C. TO PROVIDE AND INSTALL POWER WIRING COMPLETE TO DISCONNECT. PROVIDE UNIT MOUNTED DISCONNECT.
2. PROVIDE LOW AMBIENT OPERATION CAPABILITY.
3. PROVIDE WITH CRANKCASE HEATER.
4. UL LISTED WITH UL LABEL
5. UNIT SHALL BE DESIGNED AND RATED FOR OUTDOOR INSTALLATION AND OPERATION.
6. PROVIDE 4" CONCRETE PAD.
7. CU–1 TO BE CONNECTED TO THE BUILDING AUTOMATION SYSTEM TO MONITOR MOTOR STATUS.
8. MATCHED AIR HANDLER EER=11.2
9. PROVIDE R–410A REFRIGERANT
10. O.A. TEMPERATURE PER ASHRAE IS 88°FDB AND UNIT PERFORMANCE TO BE SELECTED AT 95°FDB.
11. PROVIDE VARIABLE SPEED COMPRESSOR

NATURAL GAS UNIT HEATER SCHEDULE

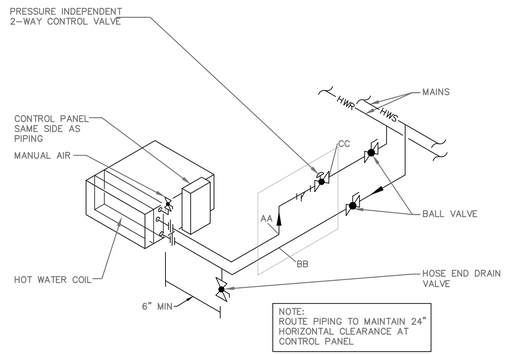
MARK	CFM	MBH OUTPUT	MOTOR HP	MOTOR VOLTS	MOTOR PH	MANUFACTURER/ MODEL NO.	REMARKS
UH–1	2180	120	1/4	120	1	MODINE PDP 150	1–4
UH–2	2180	120	1/4	120	1	MODINE PDP 150	1–4

NOTES:
1. PROVIDE REMOTE THERMOSTAT
2. 80% EFFICENCY. NATURAL GAS.
3. PROVIDE FM APPROVED NATURAL GAS TRAIN.
4. PROVIDE U.L. LABEL.

BOILER SCHEDULE

GENERAL MARK	SERVICE	MANUFACTURER	MODEL	TYPE	MBH INPUT	TURN DOWN	GAS TRAIN	OPERATING CONDITIONS @100% FIRING RATE GPM	EWT °F	LWT °F	THERMAL EFFICIENCY %	WPD	ELECTRICAL VOLTS	FLA
B–1	HEATING WATER	BOSCH	ZBR 35–3	CONDENSING	136	5:1	IRI	7	110	140	95	7.8'	120	15.5

NOTES:
1. BOILER SHALL BE ASME, AND UL RATED
2. ASME WORKING PRESSURE 160 PSI
3. PROVIDE RELIEF VALVE SET AT 50PSI
4. PROVIDE GAS PRESSURE REGULATOR FOR 5" WC INLET PRESSURE. ALLOWABLE RANGE IS 3.5" WC TO 10.5" WC.
5. CONTROL VOLTAGE IS 24 VOLTS. TRANSFORMER BY BOILER MANUFACTURER.
6. BOILER TO BE MOUNTED ON WALL
7. PROVIDE TEMPERATURE AND PRESSURE GAUGES AT EACH SUPPLY AND RETURN CONNECTION ON THE BOILER.
8. PROVIDE GAS PRESSURE REGULATOR AND FM GAS TRAIN TO BOILER.
9. PROVIDE CONTROL MODULE AS SUPPLIED BY THE MANUFACTURER. INTERLOCK WITH OWNER'S BAS FOR REMOTE MONITORING AND ACCESS.
10. PROVIDE "LOCK–UP TYPE" GAS REGULATOR.
11. PROVIDE "SMART SYSTEM" CONTROLS WITH MODULATING BURNER.
12. FLA INCLUDES BLOWER & CONTROLS AND INTERNAL CIRCULATING PUMP.
13. PROVIDE LOW TEMPERATURE VALVE (LTV) ON BOILER LOOP PIPING SYSTEM.
14. PROVIDE CHEMICAL TREATMENT PER BOILER MANUFACTURE'S RECOMMENDATIONS.
15. PROVIDE HOT WATER RESET CONTROLS AND INTERFACE WITH BAS.
16. PROVIDE NEUTRALIZATION TANK AND DISCHARGE TO FLOOR DRAIN.
17. PROVIDE EXPANSION TANK CONNECT TO COLD WATER SIDE OF BOILER.
18. EQUALS BY RINNAI & RHEEM ARE ACCEPTABLE.
19. HEATING RATING SELECTED FOR 2000–4500 FEET ELEVATION.



1 / M0.2 **TERMINAL CONTROL UNIT 2 PIPE SYSTEM**

SCALE : NTS

NOTE:
AHU–1 PRE–HEAT COIL PIPING IS SIMILAR

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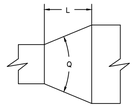
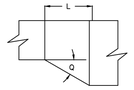
Designed RCC Drawn DAC
Checked RCC Date 10/18/16
Project No. 07002–0002



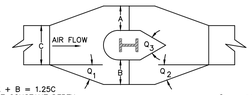
Q MAX. 45° DIVERGING, 60° CONVERGING

1 M0.3 CONCENTRIC TRANSITION
SCALE : NONE



Q MAX. 30° (EXCEPT 45° IS PERMITTED AT ROUND TO FLAT OVAL)

2 M0.3 ECCENTRIC TRANSITION
SCALE : NONE

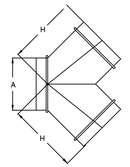


A + B = 1.25C
AT CONSTANT DEPTH

USED WHEN OBSTRUCTION EXCEEDS 20% OF SECTION AREA AND OFFSETS AROUND ARE NOT POSSIBLE

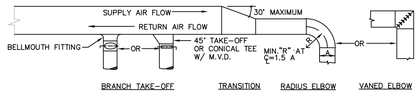
Q_1 = 20° MAX.
Q_2 = 30° MAX.
Q_3 = 60° MAX.

3 M0.3 TEARDROP EASEMENT
SCALE : NONE



H = 1.25A

4 M0.3 TAPERED Y-BRANCH
SCALE : NONE



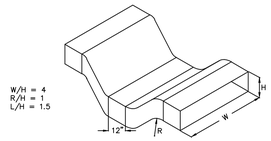
NOTES:
1. DAMPERS WITH LOCKING QUADRANTS SHALL BE PROVIDED IN ALL BRANCH DUCTS OF LOW PRESSURE SUPPLY AND RETURN DUCTS. LOCATE DAMPERS IN AREAS WITH ACCESSIBLE CEILINGS OR PROVIDE CEILING ACCESS DOORS OR REMOTE ADJUSTMENT CABLE AND LINKAGE FOR CONTROL KNOB.
2. INSULATE AND/OR LINE BRANCH DUCTS AS INDICATED.

5 M0.3 LOW PRESSURE SUPPLY, RETURN OR EXHAUST DUCTWORK
SCALE : NONE

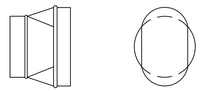
DUCT INSULATION

MATERIAL FOR EXTERNAL DUCTWORK INSULATION:
FLEXIBLE FIBERGLASS DUCTWORK INSULATION: RIGID – ASTM C 612, CLASS 1, 6 LB/CU.FT. DENSITY (MIN.); FLEXIBLE – ASTM C 553, TYPE I, CLASS B-4. PROVIDE VAPOR BARRIER MATERIAL FOR DUCTWORK INSULATION (WRAP) FS-HH-B-100; PAPER-BACKED ALUMINUM FOIL ON ROUND DUCT.

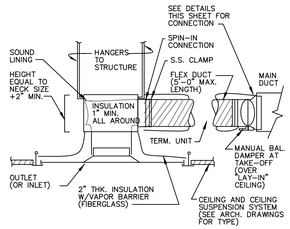
ALL RECTANGULAR AND SQUARE DUCT, INSTALL 1-1/2" THICK, 3.0 PCF BOARD INSULATION WITH ALUMINUM FOIL VAPOR BARRIER.



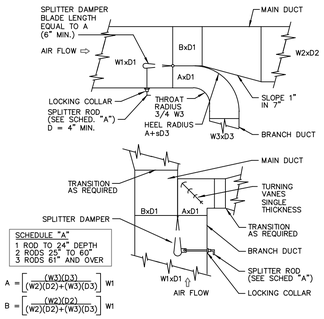
6 M0.3 RECTANGULAR DUCT W 4 45° ELLS
SCALE : NONE



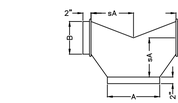
7 M0.3 CONCENTRIC FLAT OVAL TO ROUND
SCALE : NONE



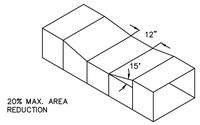
10 M0.3 GRILL/DIFFUSER MOUNTING
SCALE : NONE



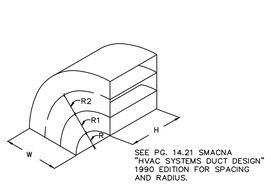
11 M0.3 RECTANGULAR DUCT SPLIT CONNECTION
SCALE : NONE



8 M0.3 BULLHEAD TEE
SCALE : NONE

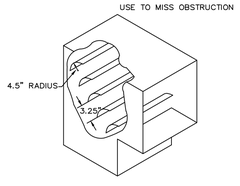


9 M0.3 RECTANGULAR DUCT DEPRESSION
SCALE : NONE

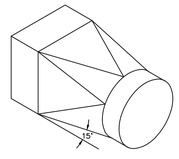


SEE PG. 14.21 SMACNA "HVAC SYSTEMS DUCT DESIGN" 1990 EDITION FOR SPACING AND RADIUS.

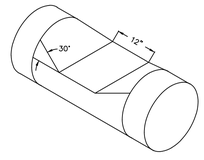
12 M0.3 SMOOTH RADIUS ELBOW
SCALE : NONE



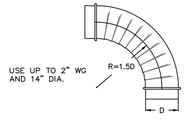
13 M0.3 RECTANGULAR ELBOW
SCALE : NONE



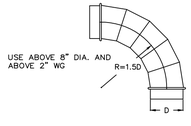
14 M0.3 ROUND TO RECTANGULAR
SCALE : NONE



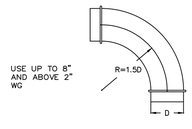
15 M0.3 ROUND DUCT DEPRESSION
SCALE : NONE



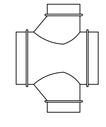
16 M0.3 PLEATED ELBOW (ROUND ONLY)
SCALE : NONE



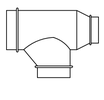
17 M0.3 GORED ELBOW (ROUND/FLAT OVAL)
SCALE : NONE



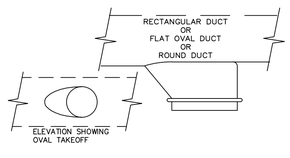
18 M0.3 DIE-STAMPED ELBOW (ROUND ONLY)
SCALE : NONE



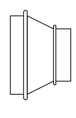
19 M0.3 LOLOSS CROSS (ROUND OR FLAT OVAL)
SCALE : NONE



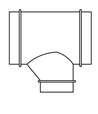
20 M0.3 REDUCING LOLOSS TEE
SCALE : NONE



21 M0.3 CONTOURED FLANGED LOLOSS TEE
SCALE : NONE



22 M0.3 CONCENTRIC REDUCER
SCALE : NONE



23 M0.3 LOLOSS TEE (ROUND OR FLAT OVAL)
SCALE : NONE

McKIM&CREED
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Asheville, NC 28806
828/252-8181 Voice
828/252-8857 Fax
NC License No. F-1222

Designed RCC Drawn DAC
Checked RCC Date 10/18/16
Project No. 07002-0002

NORTH CAROLINA PROFESSIONAL SEAL 16277 ENGINEER RICHARD C. COOPER
10/18/16

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

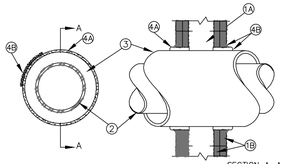
architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

M0.3

SYSTEM NO. W-L-5001

MAY 19, 2005

F RATINGS – 1 AND 2 HR (SEE ITEM 1)
T RATINGS – 3/4, 1, AND 1-1/2 HR (SEE ITEM 3)
L RATING AT AMBIENT – 2 CFM PER SQ. FT.
L RATING AT 400°F – LESS THAN 1 CFM PER SQ. FT.



SECTION A–A

1. WALL ASSEMBLY – THE 1 OR 2 HR FIRE–RATED GYPSUM BOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300, U400 OR V400 SERIES WALL OR PARTITION DESIGN IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3–5/8 IN. (92 MM) WIDE BY 1–3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

   B. GYPSUM BOARD* – NOM 5/8 IN. (16 MM) THICK, 4 FT (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM BOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL DESIGN IN THE UL FIRE RESISTANCE DIRECTORY.
   MAX DIAM OF OPENING IS 14–1/2 IN. (368 MM) FOR WOOD STUD WALLS AND 18 IN. (457 MM) FOR STEEL STUD WALLS.

   THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS 1 HR WHEN INSTALLED IN A 1 HR FIRE RATED WALL AND 2 HR WHEN INSTALLED IN A 2 HR FIRE RATED WALL.

2. THROUGH PENETRANTS – ONE METALLIC PIPE OR TUBING TO BE CENTERED WITHIN THE FIRESTOP SYSTEM. PIPE OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES OR TUBING MAY BE USED:

   A. STEEL PIPE – NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. COPPER TUBING – NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   C. COPPER PIPE – NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

3. PIPE COVERING* – NOM 1 OR 2 IN. (25 OR 51 MM) THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF OR 56 KG/M3) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY–APPLIED SELF–SEALING LAP TAPE. TRANSVERSE JOINTS SEALED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT. WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED, THE ANNULAR SPACE BETWEEN THE PIPE COVERING AND THE CIRCULAR CUTOUT IN THE GYPSUM WALLBOARD LAYERS ON EACH SIDE OF THE WALL SHALL BE MIN 1/4 IN. (6 MM) TO MAX 3/8 IN. (10 MM) WHEN NOM 2 IN. (51 MM) THICK PIPE COVERING IS USED, THE ANNULAR SPACE BETWEEN THE PIPE COVERING AND THE CIRCULAR CUTOUT IN THE GYPSUM BOARD LAYERS ON EACH SIDE OF THE WALL SHALL BE MIN 1/2 IN. (13 MM) TO MAX 3/4 IN. (19 MM)

   SEE PIPE AND EQUIPMENT COVERING MATERIALS (BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

   THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS 3/4 HR WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS 1 HR AND 1–1/2 HR WHEN NOM 2 IN. (52 MM) THICK PIPE COVERING IS USED WITH 1 HR AND 2 HR FIRE RATED WALLS, RESPECTIVELY.

4. FIRESTOP SYSTEM – INSTALLED SYMMETRICALLY ON BOTH SIDES OF WALL ASSEMBLY. THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

   A. FILL, VOID OR CAVITY MATERIALS* – WRAP STRIP – NOM 1/4 IN. (6 MM) THICK INTUMESCENT ELASTOMERIC MATERIAL FACED ON ONE SIDE WITH ALUMINUM FOIL, SUPPLIED IN 2 IN. (51 MM) WIDE STRIPS. NOM 2 IN. (51 MM) WIDE STRIP TIGHTLY WRAPPED AROUND PIPE COVERING (FOIL SIDE OUT) WITH SEAM BUTTED. WRAP STRIP LAYER SECURELY BOUND WITH STEEL WIRE OR ALUMINUM FOIL TAPE AND SLID INTO ANNULAR SPACE APPROX 1–1/4 IN. (32 MM) SUCH THAT APPROX 3/4 IN. (19 MM) OF THE WRAP STRIP WIDTH PROTRUDES FROM THE WALL SURFACE. ONE LAYER OF WRAP STRIP IS REQUIRED WHEN NOM 1 IN. (25 MM) THICK PIPE COVERING IS USED. TWO LAYERS OF WRAP STRIP ARE REQUIRED WHEN NOM 2 IN. (51 MM) THICK PIPE COVERING IS USED.

   3M COMPANY – FS–195+

   B. FILL, VOID OR CAVITY MATERIALS* – CAULK OR SEALANT – MIN 1/4 IN. (6 MM) DIAM CONTINUOUS BEAD APPLIED TO THE WRAP STRIP/WALL INTERFACE AND TO THE EXPOSED EDGE OF THE WRAP STRIP LAYER APPROX 3/4 IN. (19 MM) FROM THE WALL SURFACE.

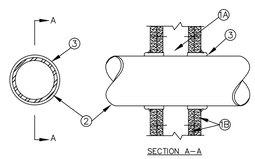
   3M COMPANY– CP 25WB+, IC 15WB+, FIREDAM 150+ CAULK OR FB–3000 WT SEALANT

   * BEARING THE UL CLASSIFICATION MARK.

SYSTEM NO. W-L-1001

JUNE 15, 2005

F RATINGS – 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)
T RATINGS – 0, 1, 2, 3 AND 4 HR (SEE ITEM 3)
L RATING AT AMBIENT – LESS THAN 1 CFM PER SQ. FT.
L RATING AT 400°F – LESS THAN 1 CFM PER SQ. FT.



SECTION A–A

1. WALL ASSEMBLY – THE 1, 2, 3 OR 4 HR FIRE–RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 H FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3–5/8 IN. (92 MM) WIDE BY 1–3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

   B. GYPSUM BOARD* – NOM 1/2 OR 5/8 IN. (13 OR 16 MM) THICK, 4 FT. (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS
   SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 26 IN. (660 MM).

2. THROUGH–PENETRANT – ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. / (0 MM). (POINT CONTACT) TO MAX 2 IN. (51 MM) PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

   A. STEEL PIPE –– NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

   B. IRON PIPE – NOM 24 IN. (610 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.

   C. CONDUIT – NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.

   D. COPPER TUBING – NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

   E. COPPER PIPE – NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

   F. THROUGH PENETRATING PRODUCT* – FLEXIBLE METAL PIPING THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:

      1. NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

      OMEGA FLEX INC

      2. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

      TITEFLEX CORP A BUNDY CO

      3. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

      WARD MFG INC

3. FILL, VOID OR CAVITY MATERIAL* – CAULK OR SEALANT– MIN 5/8, 1–1/4, 1–7/8 AND 2–1/2 IN. (16, 32, 48 AND 64 MM) THICKNESS OF CAULK FOR 1, 2, 3 AND 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW:

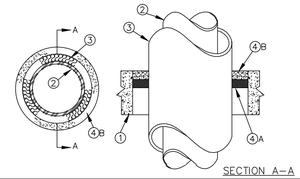
MAX PIPE OR CONDUIT DIAM IN (MM)	F RATING HR.	T RATING HR
1 (25)	1 OR 2	0+, 1 OR 2
1 (25)	3 OR 4	3 OR 4
4 (102)	1 OR 2	0
6 (152)	3 OR 4	0
12 (305)	1 OR 2	0

+ WHEN COPPER PIPE IS USED, T RATING IS 0 H.
3M COMPANY – CP 25WB+ OR FB–3000 WT.
* BEARING THE UL CLASSIFICATION MARK.

SYSTEM NO. C-AJ-5001

MARCH 05, 2007

F RATINGS – 1–1/2, 2 AND 3 HR (SEE ITEM 4)
T RATINGS – 0, 1/2, 3/4 AND 1 HR (SEE ITEMS 1A AND 4)
L RATING AT AMBIENT – 2 CFM PER SQ. FT.
L RATING AT 400°F – LESS THAN 1 CFM PER SQ. FT.



SECTION A–A

1. FLOOR OR WALL ASSEMBLY – MIN 2–1/2 IN. (64 MM) THICK REINFORCED LIGHTWEIGHT OR NORMAL WEIGHT (100–150 PCF OR 1600–2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF OPENING IS 18 IN. (457 MM).

   SEE CONCRETE BLOCKS (CAZT) CATEGORY IN THE FIRE RESISTANCE DIRECTORY FOR NAMES OF MANUFACTURERS.

1A. STEEL SLEEVE – (OPTIONAL, NOT SHOWN) – NOM 10 IN. (254 MM) (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL SLEEVE CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY. SLEEVE MAY EXTEND A MAX OF 2 IN. (51 MM) ABOVE TOP OF FLOOR OR BEYOND EITHER SURFACE OF WALL. T RATING IS 0 HR WHEN SLEEVE IS USED.

2. THROUGH PENETRANT – NOM 4 IN. (102 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE OR NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE CENTERED IN THE OPENING AND RIGIDLY SUPPORTED ON BOTH SIDES OF THE FLOOR OR WALL ASSEMBLY.

3. PIPE COVERING* – NOM 1/2 TO 2 IN. (13 TO 51 MM) THICK HOLLOW CYLINDRICAL HEAVY DENSITY (MIN 3.5 PCF OR 56 KG/M3) GLASS FIBER UNITS JACKETED ON THE OUTSIDE WITH AN ALL SERVICE JACKET. LONGITUDINAL JOINTS SEALED WITH METAL FASTENERS OR FACTORY–APPLIED SELF–SEALING LAP TAPE. TRANSVERSE JOINTS SECURED WITH METAL FASTENERS OR WITH BUTT STRIP TAPE SUPPLIED WITH THE PRODUCT.

   SEE PIPE AND EQUIPMENT COVERING – MATERIALS* (BRGU) CATEGORY IN BUILDING MATERIALS DIRECTORY FOR NAMES OF MANUFACTURERS. ANY PIPE COVERING MATERIAL MEETING THE ABOVE SPECIFICATIONS AND BEARING THE UL CLASSIFICATION MARKING WITH A FLAME SPREAD INDEX OF 25 OR LESS AND A SMOKE DEVELOPED INDEX OF 50 OR LESS MAY BE USED.

4. FIRESTOP SYSTEM – THE DETAILS OF THE FIRESTOP SYSTEM SHALL BE AS FOLLOWS:

   A. PACKING MATERIAL – MIN 1 IN. (25 MM) THICKNESS OF FIRMLY PACKED MINERAL WOOL BATT INSULATION USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR SLEEVE OR FROM BOTH SURFACES OF WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF CAULK FILL MATERIAL (ITEM B).

   B. FILL, VOID OR CAVITY MATERIAL* – CAULK OR SEALANT – APPLIED TO FILL THE ANNULAR SPACE FLUSH WITH THE TOP SURFACE OF THE FLOOR OR SLEEVE OR FLUSH WITH BOTH SURFACES OF WALL. WHEN NOM PIPE COVERING THICKNESS IS 2 IN. (51 MM), MIN THICKNESS OF CAULK FILL MATERIAL IS 2 IN. (51 MM). WHEN NOM PIPE COVERING THICKNESS IS 1–1/2 IN. (38 MM) OR LESS, MIN THICKNESS OF CAULK FILL MATERIAL IS 1 IN. (25 MM). THE HOURLY F AND T RATINGS OF THE FIRESTOP SYSTEM ARE DEPENDENT UPON THE THICKNESS OF THE FLOOR OR WALL, THE SIZE OF PIPE, THE THICKNESS OF PIPE COVERING MATERIAL AND THE SIZE OF THE ANNULAR SPACE (BETWEEN THE PIPE COVERING MATERIAL AND THE EDGE OF THE CIRCULAR THROUGH OPENING) AS SHOWN IN THE FOLLOWING TABLE:

MIN FLOOR OR WALL THKNS, IN.	MAX PIPE DIAM, IN.	NOM PIPE COVERING THKNS, IN.	ANNULAR SPACE IN.	F RATING HR.	T RATING HR.
2–1/2 (64)	4 (102)	1 or 1–1/2 (25 or 38)	1/2 to 2–3/8 (13 to 60)	2	1
4–1/2 (114)	4 (102)	2 (51)	1/4 to 3–5/8 (6 to 92)	2	1–1/2
2–1/2 (64)	12 (305)	1 (25)	1/2 to 1–1/2 (13 to 38)	2	1/2
4–1/2 (114)	12 (305)	1 (25)	1/2 to 2–3/8 (13 to 60)	3	1
2–1/2 (64)	12 (305)	1/2 (13)	1/2 to 2–3/8 (13 to 60)	2	0

3M COMPANY – CP 25WB+ or FB–3000 WT

* BEARING THE UL CLASSIFICATION MARK.

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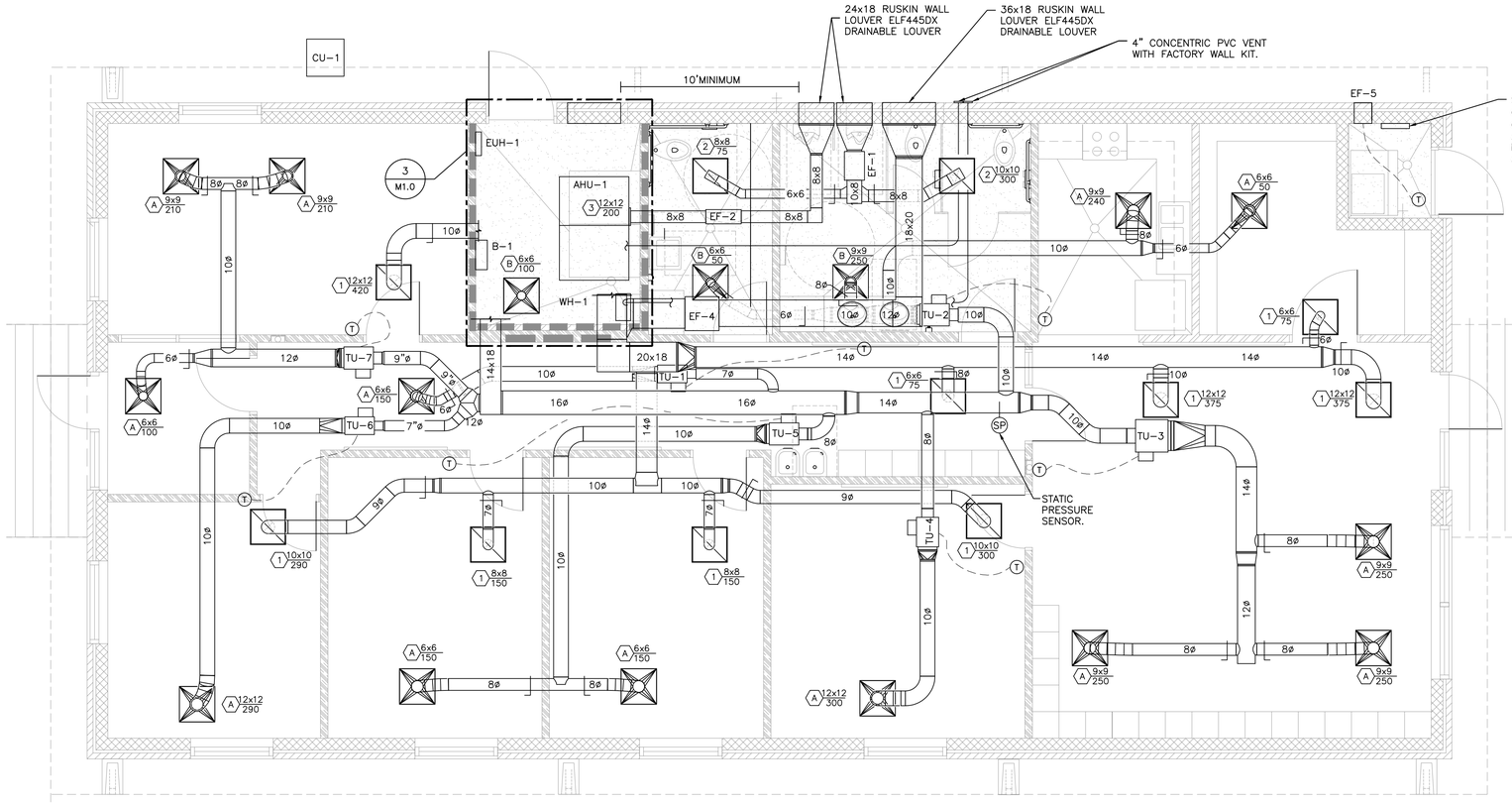
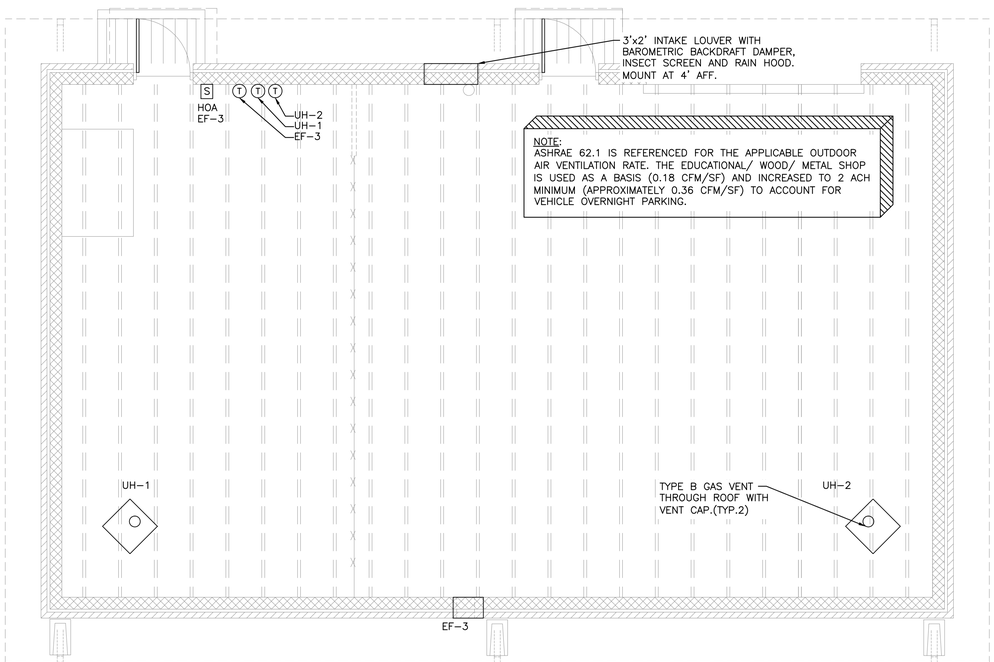
Designed RCC Drawn DAC
Checked RCC Date 10/18/16
Project No. 07002-0002

10/18/16



1 M1.0 MECHANICAL HVAC- NEW WORK

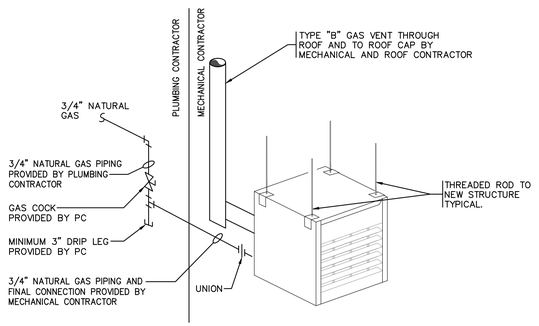
SCALE : 1/4" = 1'-0"



2 M1.0 MECHANICAL HVAC- NEW WORK

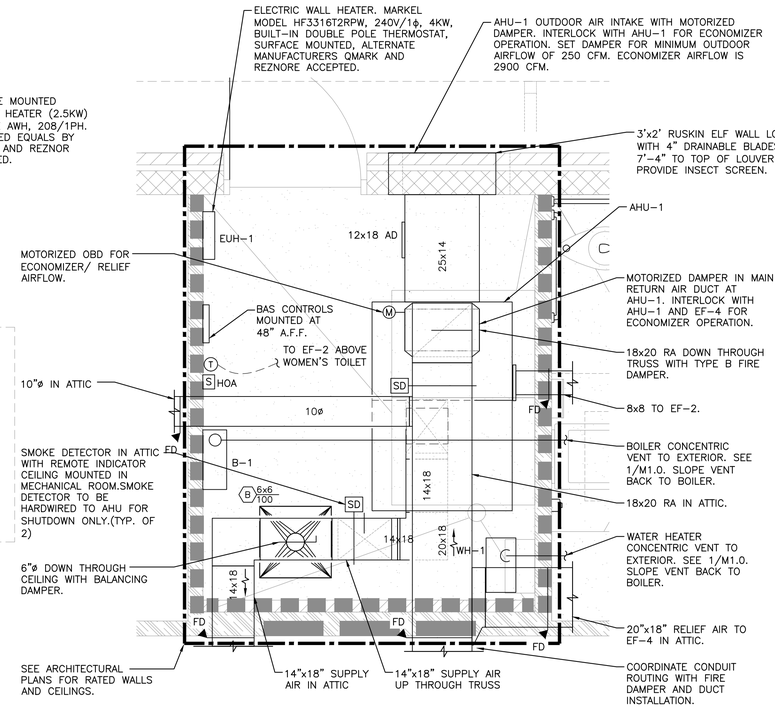
SCALE : 1/4" = 1'-0"

NOTE:
ALL DUCT AND TERMINAL UNITS ROUTED IN ATTIC WITH BRANCH DUCT DROPS TO CEILING MOUNTED DIFFUSERS AND GRILES.



4 M1.0 NG UNIT HEATER DETAIL

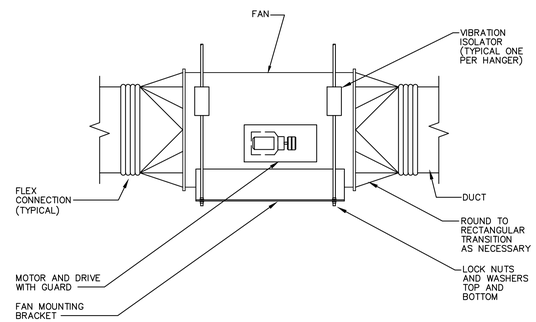
SCALE : NTS



3 M1.0 DETAIL-MECHANICAL EQUIPMENT ROOM- DUCT

SCALE : 1/2" = 1'-0"

NOTE: PROVIDE ACCESS DOORS FOR ALL FIRE DAMPERS.



5 M1.0 INLINE EXHAUST FAN DETAIL

SCALE : NTS

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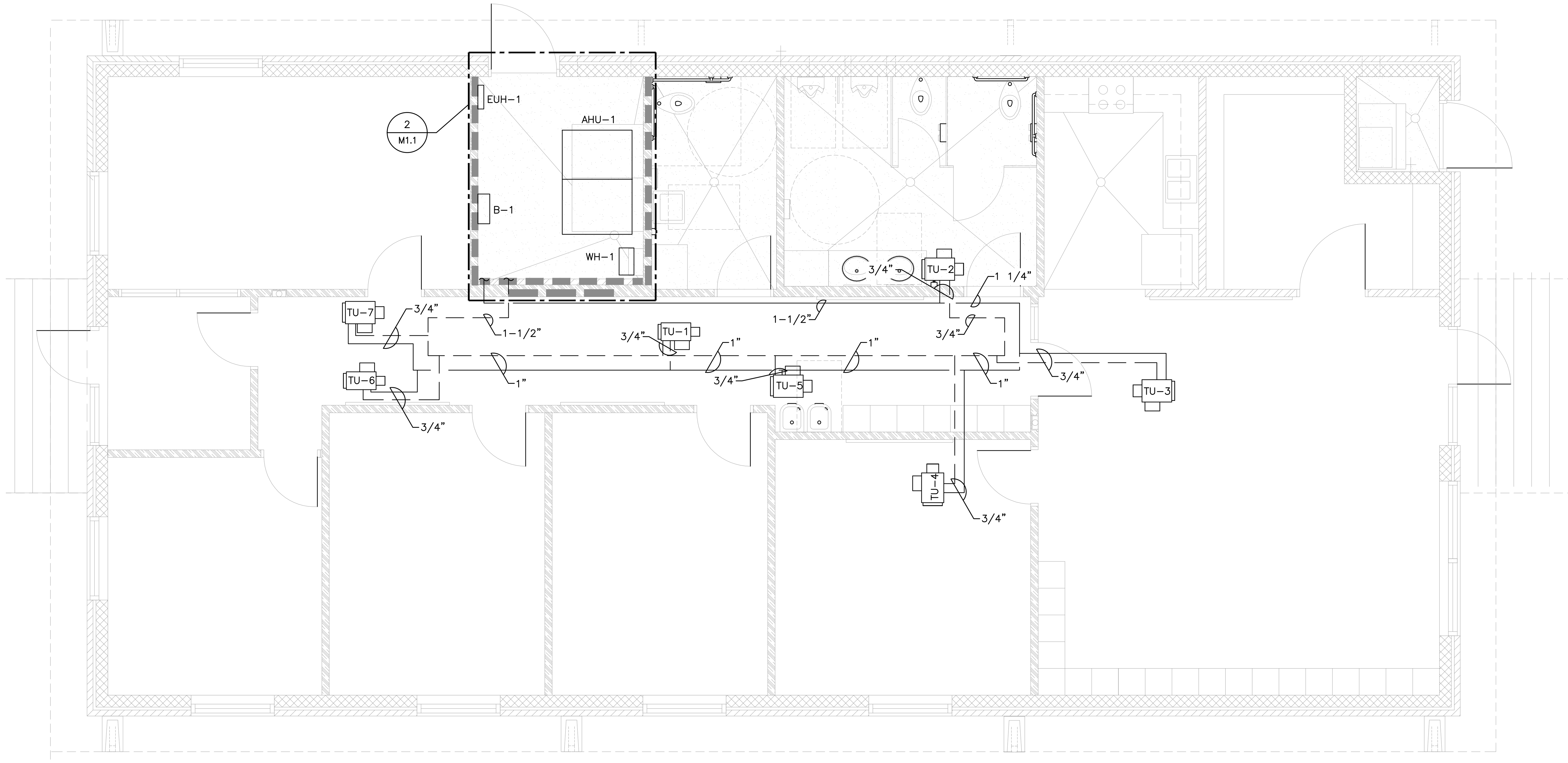
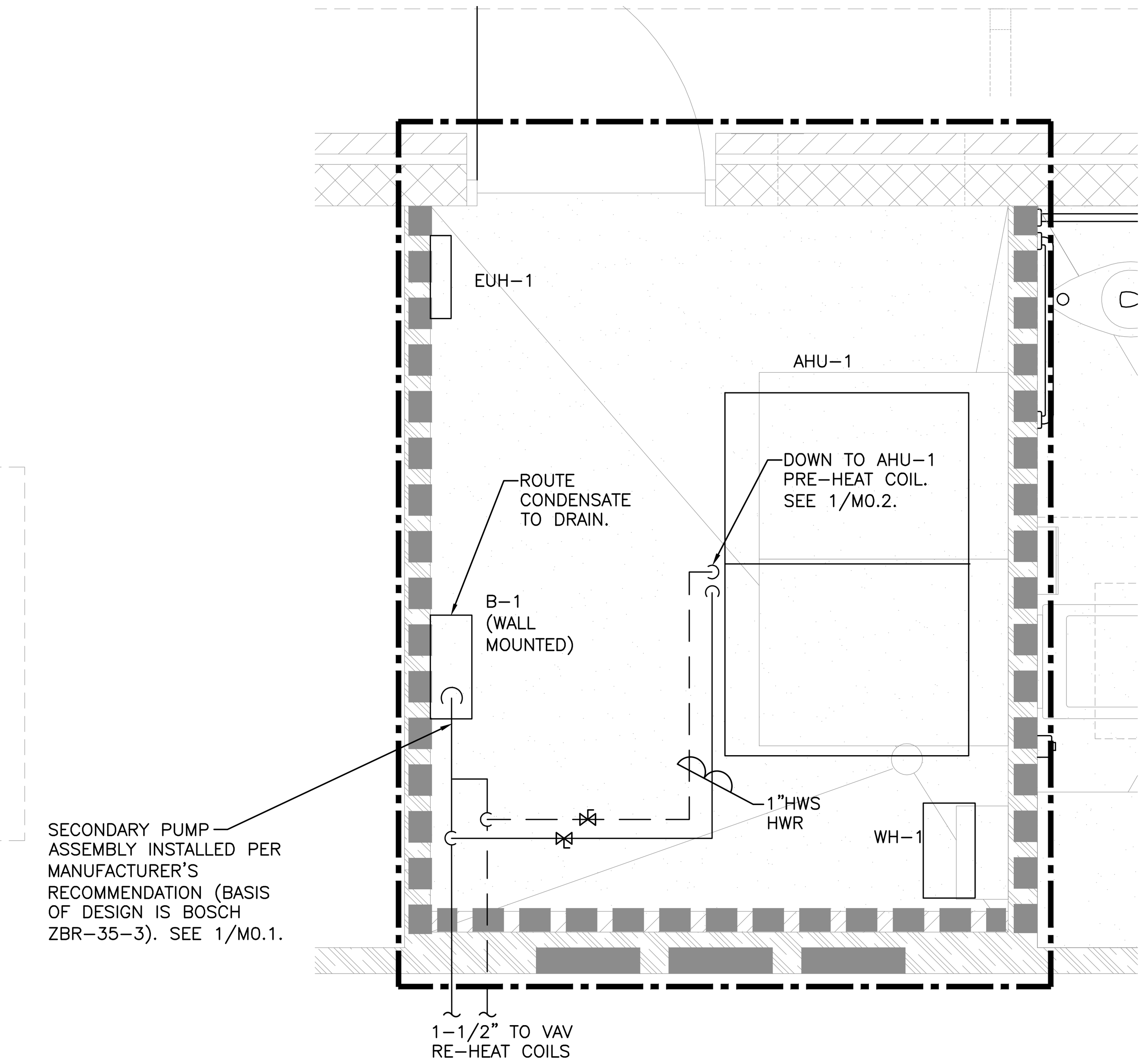


MECHANICAL PIPING- NEW WORK

1 / M1.1 SCALE : 1/4" = 1'-0"



DETAIL-MECHANICAL EQUIPMENT ROOM- PIPING

2 / M1.1 SCALE : 1/2" = 1'-0"

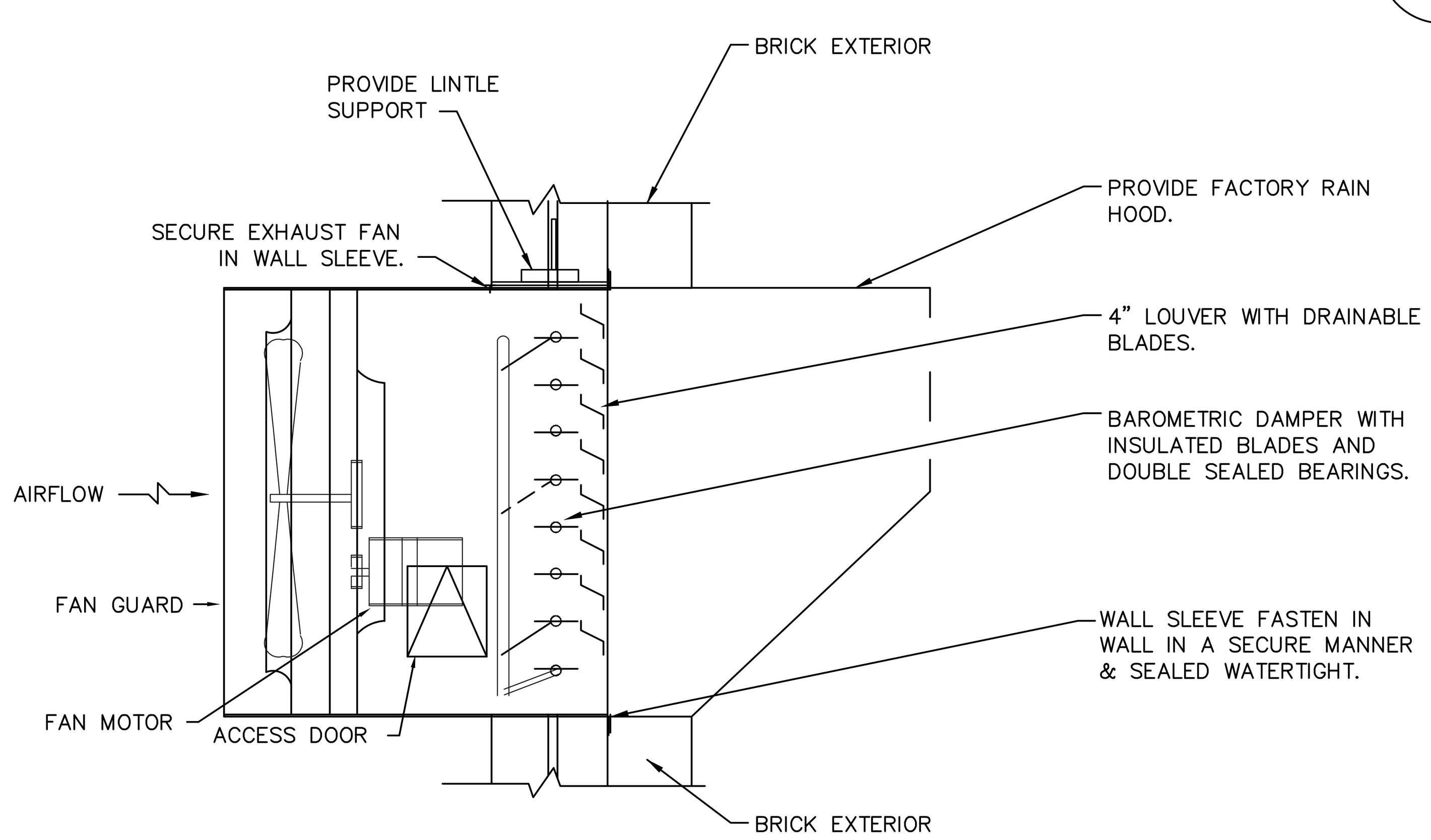
SEQUENCE OF OPERATION

AHU-1
UNIT SHALL RUN IN THE OCCUPIED MODE WITH DISCHARGE AIR TEMPERATURE OF 55°FDB AT OUTDOOR AIR TEMPERATURES ABOVE 65°FDB. THE DISCHARGE AIR TEMPERATURE SHALL BE RESET TO 65°FDB AT OUTDOOR AIR TEMPERATURES BELOW 65°FDB. THE PRE-HEAT COIL SHALL BE DISABLED AT OUTDOOR AIR TEMPERATURES BETWEEN 50°FDB AND 55°FDB. UNIT SHALL OPERATE IN ECONOMIZER MODE AT OUTDOOR AIR TEMPERATURES BETWEEN 50°FDB AND 65°FDB. ECONOMIZER SHALL ENERGIZE EF-4 AND OUTDOOR AIR INTAKE DAMPER TO OPEN 100%. THE OUTDOOR AIR DAMPER SHALL CLOSE WHEN UNIT IS OFF.

B-1
UNIT AND RP-1 SHALL RUN IN THE OCCUPIED MODE WITH SUPPLY WATER TEMPERATURE OF 140°F AND RETURN WATER TEMPERATURE OF 110°F AND WHEN OUTDOOR TEMPERATURE IS LESS THAN 70°FDB. CIRCULATING PUMP SHALL RUN WHENEVER BOILER IS ENERGIZED. SUPPLY WATER SHALL RESET TO 110°F AT 80°F OUTDOOR AIR TEMPERATURE.

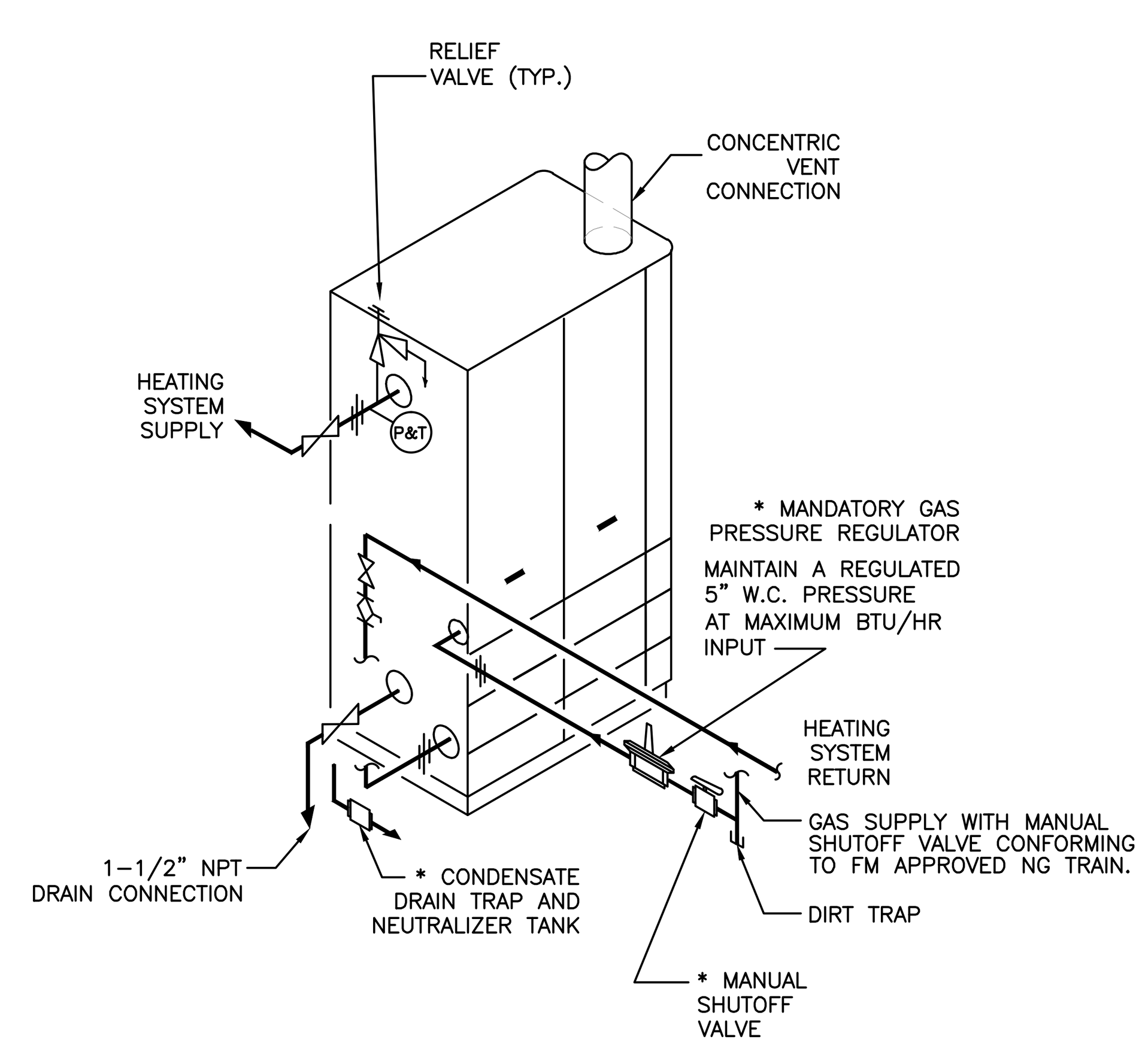
PROVIDE BUILDING AUTOMATION SYSTEM (BAS) WITH REMOTE MONITORING BY DOT MAINTENANCE STAFF. BAS TO MONITOR AHU-1 SUPPLY AIR TEMPERATURE, AHU-1 RETURN AIR TEMPERATURE, B-1 SUPPLY WATER TEMPERATURE, B-1 RETURN WATER TEMPERATURE, FIRE ALARM CONTROL PANEL, ROOM TEMPERATURE THROUGH THERMOSTATS, ROOM TEMPERATURE SETPOINTS, DISCHARGE AIR TEMPERATURE AT EACH TERMINAL UNIT AND DISCHARGE AIRFLOW AT EACH TERMINAL UNIT. AHU-1 SUPPLY AIR FAN SHALL BE CONTROLLED BY DUCT MOUNTED STATIC PRESSURE SENSOR AND AIRFLOW RESET PER STATIC PRESSURE CHANGES.

VAV SEQUENCE
THE VARIABLE VOLUME TERMINAL UNITS (VAV'S) SHALL BE FULL OPEN DURING COOLING MODE. UPON A CALL FOR HEATING, THE VAV HOT WATER VALVE WILL MODULATE TO MAINTAIN A DISCHARGE AIR TEMPERATURE AS DEFINED BY THE USER AND THE VAV AIR VALVE WILL MODULATE TO 50% OPEN. UPON A FURTHER CALL FOR HEATING, THE VAV AIR VALVE WILL MODULATE TO 100% OPEN AND THE HOT WATER VALE WILL MODULATE TO MAINTAIN THE DISCHARGE AIR TEMPERATURE SET BY THE USER.



SIDEWALL EXHAUST FAN DETAIL

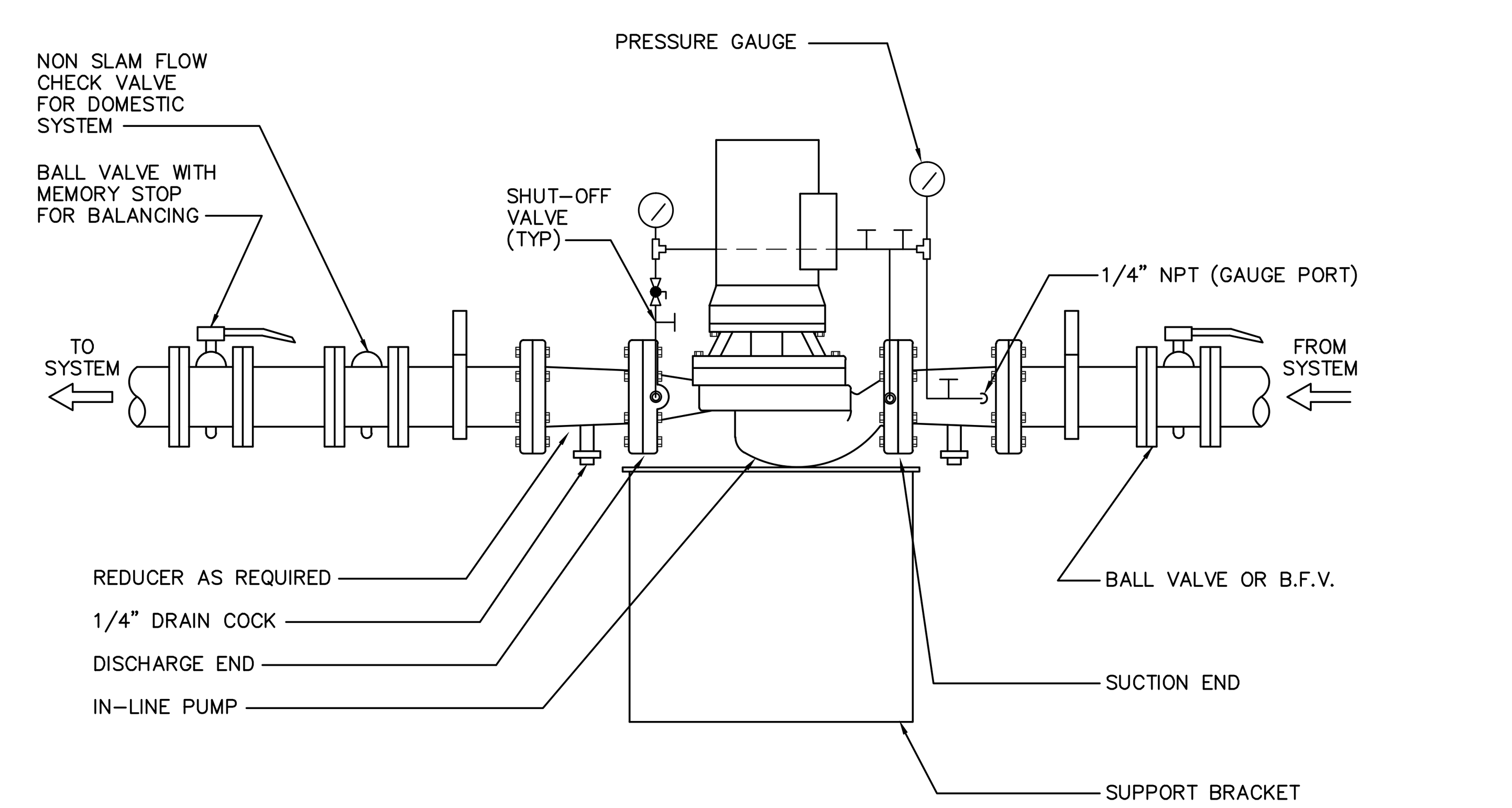
3 / M1.1 SCALE : NTS



HOT WATER BOILER PIPING DETAIL(B-1)

4 / M1.1 SCALE : NTS

NOTE:
SEE MANUFACTURERS (BOSCH) INSTALLATION INSTRUCTIONS



INLINE CIRCULATION PUMP DETAIL (RP-1)

5 / M1.1 SCALE : NTS

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ELECTRICAL GENERAL NOTES AND SPECIFICATIONS

A. ALL WORK SHALL BE IN ACCORDANCE WITH, THE NATIONAL ELECTRICAL CODE, 2014 EDITION AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES. ELECTRICAL CONTRACTOR SHALL SECURE AND PAY FOR ALL LICENSES, FEES, PERMITS, AND UTILITY CHARGES IF REQUIRED. BOTH CONTRACTOR AND INSTALLING MECHANIC ARE REMINDED THAT SINCE THE NATIONAL ELECTRICAL CODE IS BY STATUTORY INCLUSION A PART OF THE LAWS OF THE STATE THEY BEAR A PRIME RESPONSIBILITY TO COMPLY WITH IT EVEN WHEN THE DRAWINGS OR SPECIFICATIONS DENOTE AN APPARENT VIOLATION. THIS SHOULD BE OBSERVED CAREFULLY AND CONTINUOUSLY, PARTICULARLY DURING ESTIMATING FOR PROPOSAL, AND ANY DISCREPANCIES SHOULD BE BROUGHT TO THE ATTENTION OF THE ENGINEER FOR RESOLUTION.

B. ELECTRICAL CONTRACTOR SHALL MAINTAIN ON THE SITE AN ADEQUATE ADMINISTRATIVE SPACE WHERE ONE COMPLETE SET OF DRAWINGS AND SPECIFICATIONS SHALL BE KEPT FOR THE WORK OF ALL TRADES ON THE PROJECT. THESE SHALL BE IN ADDITION TO THE SETS USED BY THE MECHANICS IN CARRYING OUT THEIR WORK ON THE PROJECT. THE PROJECTED LOCATION OF EVERY OUTLET, RACEWAY, OR ITEM OF EQUIPMENT TO BE INSTALLED UNDER THIS CONTRACT SHALL BE CHECKED AGAINST THE DRAWINGS AND SPECIFICATIONS OF ALL THE OTHER TRADES AS WELL AS BY DAY-TO-DAY CONFERENCE WITH WORKMEN AND SUPERVISORS OF ALL OTHER TRADES TO THE END THAT ANY CONFLICTS OR UNCERTAINTIES ABOUT LOCATIONS ARE RESOLVED BEFORE WORK IS INSTALLED, PARTICULARLY WITH REGARD TO THE INTERACTION OF LIGHTING FIXTURES, AIR HANDLING OPENINGS, ACCESS DOORS, SPRINKLER HEADS, ETC. CEILING CONSTRUCTION INSTALLATION SHALL BE MADE IN ACCORD WITH REFLECTED CEILING PLANS AND/OR INSTRUCTIONS BY THE ARCHITECT'S REPRESENTATIVES ON THE SITE. MOVING OF ITEMS FROM LOCATIONS SHOWN, REROUTING, OR CHANGES TO ACCOMPLISH ANY WORK AS SHOWN ON PLANS OR SPECIFICATIONS IN ORDER TO ACCOMPLISH THIS COORDINATION SHALL NOT BE CAUSE FOR CLAIM FOR ADDITIONAL COMPENSATION FOR THE WORK. PARTICULAR CARE SHALL BE TAKEN TO LOCATE BOXES SO THEY ARE NOT BACK-TO-BACK IN WALLS AND TO LOCATE OUTLETS OFF COLUMNS (UNLESS VITAL THEY BE THERE) OR OTHER PLACES WHERE THEY CONFLICT WITH STRUCTURAL STEEL OR REINFORCING BARS.

C. CONTRACTOR SHALL MAINTAIN AT THE SITE A COMPLETE SET OF ALL SHOP DRAWINGS, FIXTURE AND EQUIPMENT CUTS, MANUFACTURER'S WIRING DIAGRAMS AND INSTALLATION DATA. PERSONNEL SHALL STUDY THIS DATA BEFORE AND DURING INSTALLATION AND ROUGHING SO AS TO PREPARE FOR THE PROPER FIT AND FUNCTION UPON COMPLETION.

D. IN GENERAL, MOUNTING HEIGHTS OF OUTLETS, SWITCHES, ETC. ARE NOTED ON THE SYMBOL SCHEDULE. SCHEDULES AND NOTES SPECIFY "STANDARD" MOUNTING HEIGHTS FOR THESE ITEMS. STUDY CAREFULLY ELEVATIONS OF ALL WALLS AND CABINET WORK AS SHOWN ON ARCHITECTURAL DRAWINGS AND FIT OUTLETS TO SPACE AND TO AVOID CONFLICTS. OUTLETS SHALL ALWAYS BE LOCATED ABOVE, AND NOT IN BACKSPLASHES, WHEREVER POSSIBLE. COORDINATE OUTLET LOCATIONS WITH OTHER TRADES TO AVOID CONFLICTS. ANY CONFLICT THAT CANNOT BE RESOLVED ON THE JOB SHOULD BE BROUGHT TO THE ATTENTION OF THE ARCHITECT OR ENGINEER PRIOR TO ROUGHING.

E. CIRCUIT WIRE SIZING FOR 20 AMP CIRCUITS SHALL BE IN ACCORD WITH THE FOLLOWING TABLE:

VOLTS	DISTANCE	HOME RUN	REMAINDER OF CIRCUIT	
120	0' – 50'	#12	#12	IF THESE CONDUCTORS ARE INCREASED IN SIZE DUE TO
	50' – 100'	#10	#12	VOLTAGE DROP, THE GROUND CONDUCTOR MUST BE
	100' – 150'	# 8	#10	PROPORTIONATELY INCREASE PER NEC ARTICLE 250.122.

F. ALL WIRING LUGS THROUGHOUT THE PROJECT, INCLUDING BUT NOT LIMITED TO BREAKERS, PANELBOARD/SWITCHBOARD LUGS, SAFETY SWITCH LUGS, AND TRANSFORMER LUGS, SHALL BE RATED FOR USE WITH 75°C CONDUCTORS SIZED IN ACCORDANCE WITH NEC TABLE 310.15(B)(16).

G. ALL RACEWAYS SHALL BE EMT UNLESS SPECIFICALLY NOTED OR APPROVED OTHERWISE. ALL RACEWAYS MOUNTED ON THE ROOF OR EXTERIOR SHALL BE RIGID METALLIC WITH LIQUID-TIGHT METALLIC FLEX CONDUIT (36" MAX) WHIPS FOR MOTORIZED EQUIPMENT. ALL CIRCUITS SHALL BE IN RACEWAYS. CONCEAL ALL CABLE AND RACEWAYS IN FINISHED AREAS OF BUILDING. PROVIDE COMPRESSION GLAND TYPE FITTINGS MADE OF MALLEABLE, GALVANIZED OR SHERARDIZED STEEL. POT-METAL OR CAST-TYPE FITTINGS SHALL NOT BE PERMITTED ON THIS PROJECT. SET SCREW OR INDENTOR TYPE CONNECTOR OR COUPLING SHALL NOT BE PERMITTED. COLOR CODE CONDUIT.

H. RACEWAYS FOR UNDERGROUND INSTALLATIONS SHALL BE SCH 40 PVC WITH GLUED COUPLINGS. USE WATER TIGHT COUPLINGS FOR CONNECTIONS TO INGROUND JUNCTION BOXES.

I. PENETRATIONS OF REQUIRED SMOKE TIGHT PARTITIONS SHALL BE SEALED USING METHODS APPROVED UNDER THE STATE BUILDING CODE. COORDINATION WITH THE OWNER AND ENGINEER SHALL BE MAINTAINED TO ENSURE THAT THIS SMOKE STOPPING IS ACCOMPLISHED.

J. PROVIDE EXPANSION COUPLINGS FOR ALL CONDUITS CROSSING BUILDING EXPANSION JOINTS. REFER TO ARCHITECTURAL PLANS FOR EXPANSION JOINT LOCATIONS.

K. CONDUCTOR INSULATION SHALL BE THHN/THWN. MINIMUM SIZE OF CONDUCTORS SHALL BE #12 AWG.

L. PROVIDE A SEPARATE, GREEN WIRE GROUNDING CONDUCTOR, SIZED PER N.E.C., IN ALL LIGHTING & POWER CIRCUITS. PROVIDE A SEPARATE WHITE NEUTRAL CONDUCTOR FOR ALL 120 VOLT BRANCH CIRCUITS (NO SHARED NEUTRALS).

M. WHERE PENETRATIONS ARE MADE THROUGH A REQUIRED FIRE-RESISTIVE WALL, FLOOR, OR PARTITION FOR THE PURPOSE OF RUNNING RACEWAY CARRYING ELECTRICAL, TELEPHONE, TELEVISION, OR LOCAL COMMUNICATION AND/OR SIGNALING CIRCUITS, THE OPENING AROUND THE RACEWAY SHALL BE FIRE STOPPED PER THE STATE BUILDING CODE SECTION 713. COORDINATION WITH THE OWNER AND ENGINEER SHALL BE MAINTAINED TO ENSURE THAT THIS FIRE STOPPING IS ACCOMPLISHED. FIRE STOPPING OF PENETRATIONS IN RATED WALLS AND FLOORS SHALL BE ACCOMPLISHED IN ACCORDANCE WITH NORTH CAROLINA STATE BUILDING CODE CHAPTER 713 USING APPROVED ASSEMBLIES SUCH AS THE FOLLOWING:

CONDUIT PENETRATIONS OF 1 OR 2 HOUR GYPBOARD WALLS – U.L.#WL1001
CONDUIT PENETRATIONS OF 1 OR 2 HOUR CONCRETE OR BLOCK WALLS – U.L.#CAJ1001
CONDUIT PENETRATIONS OF 1 OR 2 HOUR CONCRETE FLOORS – U.L.#CAJ1001

N. IN REQUIRED FIRE RATED WALLS AND PARTITIONS, OPENINGS FOR INSTALLATION OF BOXES THAT ARE GREATER THAN 16 SQUARE INCHES SHALL BE PROTECTED AS REQUIRED BY U.L.. COORDINATE CLOSELY WITH THE OWNER AND ENGINEER TO ENSURE THE INTEGRITY OF THE U.L. RATING IS MAINTAINED. BOXES OF 16 SQUARE INCHES OR LESS SHALL BE INSTALLED IN ACCORDANCE WITH U.L..

"FIRE RESISTANCE RATINGS – ANSI/UL263 (BXUV) FOR WALL AND PARTITION ASSEMBLIES"

O. ALL ELECTRICAL MATERIALS, DEVICES, APPLIANCES AND EQUIPMENT SHALL BE LABEL LISTED BY A NORTH CAROLINA APPROVED THIRD PARTY TESTING AGENCY.

P. CONDUCTORS SHALL BE COPPER WITH 75°C (THHN/THWN) MINIMUM INSULATION RUN IN METALLIC CONDUIT.

Q. ALL CONDUCTORS SHALL BE COLOR CODED AS FOLLOWS:

240DV/120V, 3-PHASE, 4-WIRE (HIGH LEG)		240V/120V, 1-PHASE, 3-WIRE	
PHASE A	BLACK	PHASE A	BLACK
PHASE B	ORANGE (HIGH LEG)	PHASE B	RED
PHASE C	BLUE	NEUTRAL	WHITE
NEUTRAL	WHITE	GROUND	GREEN
GROUND	GREEN		

R. CONTRACTOR SHALL TEST ALL "EMERGENCY" EQUIPMENT AND SYSTEMS FOR PROPER FUNCTION AND OPERATION. UPON SUCCESSFUL COMPLETION OF TESTS, CONFIRMATION SHALL BE SENT TO THE ENGINEER IN THE FORM OF A LETTER STATING THE TESTS PERFORMED, THE RESULTS, AND THE DATE TESTS WERE SUCCESSFULLY COMPLETE. "EMERGENCY" EQUIPMENT AND SYSTEMS CONSIST OF THOSE AS SPECIFIED IN NFPA 101, NFPA 99, AND THE STATE BUILDING CODE (FIRE ALARM AND EMERGENCY POWER SYSTEMS). THE TEST RECORDS MUST BE DOCUMENTED FOR THE EGRESS LIGHTING PER NEC ARTICLE 700.

S. DEVICE PLATES

1. COVER PLATES FOR FLUSH MOUNTED WIRING DEVICES AND FOR TELEPHONE OUTLETS SHALL BE TYPE "302" STAINLESS STEEL OR NYLON TYPE, STANDARD SIZE, SINGLE OR GANGED AS SHOWN ON THE DRAWINGS. COVER PLATE MOUNTING SCREWS SHALL BE SLOTTED HEAD OVAL SCREWS AND SHALL MATCH THE FINISH AND MATERIAL OF THE PLATE, AND SHALL BE FURNISHED WITH THE PLATE BY THE PLATE MANUFACTURER. QUANTITY OF 2% SPARE COVER PLATES OF EACH TYPE SHALL BE PROVIDED TO THE OWNER.

2. SWITCH AND RECEPTACLE COVER PLATES ON EXPOSED WORK SHALL BE GALVANIZED CAST FERROUS METAL, STANDARD SIZE, AND SHALL BE SINGLE OR GANGED AS INDICATED ON THE DRAWINGS.

3. EXTERIOR MOUNTED SWITCH AND RECEPTACLE PLATES, AND THOSE NOTED TO BE WEATHERPROOF, SHALL BE WEATHERPROOF PVC COVER PLATES, STANDARD SIZE, SINGLE OR GANGED AS INDICATED ON THE DRAWINGS, AND SHALL BE "APPROVED" THIRD PARTY LISTED AS "RAIN-TIGHT WHILE IN USE."

T. ELECTRICAL IDENTIFICATION

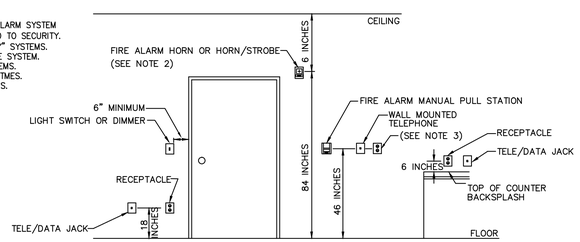
1. FURNISH AND INSTALL ENGRAVED LAMINATED PHENOLIC NAMEPLATES FOR ALL SAFETY SWITCHES, PANELBOARDS, TRANSFORMERS, SWITCHBOARDS, MOTOR CONTROL CENTERS AND OTHER ELECTRICAL EQUIPMENT SUPPLIED FOR THE PROJECT FOR IDENTIFICATION. NAMEPLATES SHALL BE SECURELY ATTACHED TO EQUIPMENT WITH SELF-TAPPING STAINLESS STEEL SCREWS; IF THE SCREW SHARP END IS PROTECTED; OTHERWISE RIVETS SHALL BE USED. LETTERS SHALL BE APPROXIMATELY 1/2 INCH HIGH MINIMUM. EMBOSSED, SELF-ADHESIVE PLASTIC TAPE IS NOT ACCEPTABLE FOR MARKING EQUIPMENT. NAMEPLATE MATERIAL COLORS SHALL BE:

.... BLUE SURFACE WITH WITE CORE FOR 120/208 VOLT EQUIPMENT
.... BLACK SURFACE WITH WHITE CORE FOR 277/480 VOLT EQUIPMENT
.... BRIGHT RED SURFACE WITH WHITE CORE FOR ALL EQUIPMENT RELATED TO FIRE ALARM SYSTEM
.... DARK RED (BURGUNDY) SURFACE WITH WHITE CORE FOR ALL EQUIPMENT RELATED TO SECURITY.
.... GREEN SURFACE WITH WHITE CORE FOR ALL EQUIPMENT RELATED TO "EMERGENCY" SYSTEMS.
.... ORANGE SURFACE WITH WHITE CORE FOR ALL EQUIPMENT RELATED TO TELEPHONE SYSTEM.
.... BROWN SURFACE WITH WHITE CORE FOR ALL EQUIPMENT RELATED TO DATA SYSTEMS.
.... WHITE SURFACE WITH BLACK CORE FOR ALL EQUIPMENT RELATED TO PAGING SYSTMES.
.... PURPLE SURFACE WITH WHITE CORE FOR ALL EQUIPMENT RELATED TO TV SYSTEMS.

LOAD SUMMARY

240Y/120V, 3ø UNDERGROUND SERVICE
PANEL DESIGNATION – MDP

PNL RATED CAPACITY	400	AMPS
LIGHTING LOAD	7.5	AMPS
RECEPTACLE LOAD	92.5	AMPS
HVAC LOAD	58.8	AMPS
MISC. LOAD	6.3	AMPS
TOTAL	165.1	AMPS



1 E0.1 **TYPICAL MOUNTING HEIGHTS OF DEVICES**

SCALE : NOT TO SCALE

NOTES:

1. SEE ELECTRICAL FLOOR PLANS AND ARCHITECTURAL WALL ELEVATIONS FOR "NON-TYPICAL" DEVICE MOUNTING HEIGHTS.
2. MOUNT OUTLET BOX AT 84" A.F.F. OR 6" DOWN FROM CEILING, WHICHEVER IS LOWER.
3. TYPICAL RECEPTACLE NOT AT COUNTER LOCATION.
4. OCCUPANCY SENSOR SHALL BE PROVIDED AS INDICATED.

TYPE: DUAL TECHNOLOGY-PASSIVE INFRARED (PIR) AND ULTRASONIC
CONTACT RATINGS: 20A-277VAC BALLAST
COVERAGE: 360 DEGREE WIDE COVERAGE PATTERN, 28FT RADIAL COVERAGE WHEN MOUNTED TO 9FT CEILING.
MANUFACTURE: SENSORSWITCH, WATTSTOPPER, LEVITON, OR EQUAL

ELECTRICAL SYMBOL LEGEND

	SOLID LINES INDICATE CONDUIT RUN CONCEALED IN WALL OR ABOVE CEILINGS, EXPOSED IN UNFINISHED AREAS. DASHED LINES INDICATE CONDUIT RUN BELOW GRADE OR BELOW FINISHED FLOOR. RUN PARALLEL OR PERPENDICULAR TO STRUCTURE OR WALL.	J	WALL MOUNTED JUNCTION BOX, SIZE PER NEC OR AS INDICATED. MOUNTING HEIGHT AS INDICATED. MOUNT FLUSH IN FINISHED SPACES OR SURFACE IN UNFINISHED SPACES
	HOMERUN TO PANELBOARD. QUANTITY OF ARROWS INDICATES NUMBER OF CIRCUITS.		125 VOLT, 3 WIRE SINGLE RECEPTACLE IN FLUSH (FINISHED SPACES) OR SURFACE (UNFINISHED SPACES) OUTLET BOX. MOUNT 46" ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED.
	SURFACE, RECESSED, OR WALL MOUNTED LIGHTING FIXTURE CONNECTED TO NORMAL BRANCH CIRCUIT. SEE LIGHTING FIXTURE SCHEDULE FOR EXACT REQUIREMENTS.		125 VOLT, 3 WIRE DUPLEX RECEPTACLES IN FLUSH (FINISHED SPACES) OR SURFACE (UNFINISHED SPACES) 2-GANG OUTLET BOX W/PLASTER RING. MOUNT 18" OR 46" ABOVE FINISHED FLOOR, OR 6" ABOVE DESK, COUNTERTOP, OR BACKSPLASH, UNLESS OTHERWISE INDICATED.
	208Y/120 OR 120/240 VOLT PANELBOARD, FLUSH AND SURFACE MOUNTED RESPECTIVELY. SEE PANEL SCHEDULE FOR DESIGN INFORMATION. DESIGNATION AS INDICATED.	GF	125 VOLT, 3 WIRE GROUND FAULT CIRCUIT INTERRUPTER TYPE RECEPTACLE. MOUNTING AS INDICATED. HUBBELL GF SERIES OR EQUIVALENT.
	CEILING MOUNTED EXIT SIGN, SHADED AREA INDICATES FACE WITH DIRECTIONAL ARROWS AS SHOWN. SEE LIGHTING FIXTURE SCHEDULE FOR EXACT REQUIREMENTS. CONNECT UNSWITCHED TO INDICATED BRANCH CIRCUIT.	WP	125 VOLT, 20 AMP, 3 WIRE TAMPER-RRESISTTANT, WEATHER-TRESISTANT, GROUND FAULT CIRCUIT INTERRUPTER TYPE RECEPTACLE WITH STAINLESS STEEL WHILE-IN-USE WEATHERPROOF COVER. MOUNTING AS INDICATED.
	WALL MOUNTED EXIT SIGN, SHADED AREA INDICATES FACE WITH DIRECTIONAL ARROWS AS SHOWN. SEE LIGHTING FIXTURE SCHEDULE FOR EXACT REQUIREMENTS. CONNECT UNSWITCHED TO INDICATED BRANCH CIRCUIT.	EWC	125 VOLT, 3 WIRE DUPLEX RECEPTACLE FOR CONNECTION TO ELECTRIC WATER COOLER. FLUSH MOUNT, COORDINATE LOCATION AND CONNECTION WITH PLUMBING CONTRACTOR.
	EMERGENCY BATTERY PACK UNIT WITH NUMBER OF LAMPS AS INDICATED. LETTER (WHERE SHOWN) INDICATES TYPE. SEE LIGHTING FIXTURE SCHEDULE FOR EXACT REQUIREMENTS. CONNECT UNSWITCHED TO INDICATED BRANCH CIRCUIT.		SPECIAL EQUIPMENT CONNECTION. SUBSCRIPT INDICATES DESIGNATION. SEE EQUIPMENT CONNECTION SCHEDULE FOR EXACT REQUIREMENTS.
S	SINGLE-POLE SWITCH IN FLUSH (FINISHED SPACES) OR SURFACE (UNFINISHED SPACES) OUTLET BOX. MOUNT 46" ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED OR REQUIRED BY SITE CONDITIONS. HUBBELL 1221 SERIES OR EQUIVALENT.		COMBINATION TELEPHONE/DATA OUTLET 18" ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED OR REQUIRED BY SITE CONDITIONS. MOUNT FLUSH IN FINISHED SPACES OR SURFACE IN UNFINISHED SPACES. SUBSCRIPT, WHEN SHOWN, INDICATES NUMBER OF JACKS.
S_3	THREE-WAY SWITCH IN FLUSH (FINISHED SPACES) OR SURFACE (UNFINISHED SPACES) OUTLET BOX. MOUNT 46" ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED OR REQUIRED BY SITE CONDITIONS. HUBBELL 1223 SERIES OR EQUIVALENT.		COMBINATION TELEPHONE/DATA OUTLET MOUNTED 46" ABOVE FINISHED FLOOR OR 6" ABOVE DESK/COUNTERTOP UNLESS OTHERWISE INDICATED. MOUNT FLUSH IN FINISHED SPACES OR SURFACE IN UNFINISHED SPACES. SUBSCRIPT, WHEN SHOWN, INDICATES NUMBER OF JACKS.
S_M	MOTOR RATED CONTACT SWITCH WITH POLES AS REQUIRED, IN FLUSH (FINISHED SPACES) OR SURFACE (UNFINISHED SPACES) OUTLET BOX. MOUNT 46" ABOVE FINISHED FLOOR OR WITHIN SIGHT OF MOTOR BEING SERVED, UNLESS OTHERWISE INDICATED.	STD	CEILING MOUNTED SMOKE DETECTOR.
F	FUSED SAFETY SWITCH, SIZE AND NUMBER OF POLES AS INDICATED BY SUBSCRIPTS. PROVIDE FUSES PER NAMEPLATE OF EQUIPMENT SERVED UNLESS OTHERWISE INDICATED. SUBSCRIPT WP INDICATES IN NEMA 3R ENCLOSURE.		
	NON-FUSED SAFETY SWITCH, SIZE AND NUMBER OF POLES AS INDICATED BY SUBSCRIPTS. SUBSCRIPT WP INDICATES IN NEMA 3R ENCLOSURE.		
OS	OCCUPANCY MOTION SENSOR SWITCH TO CONTROL LIGHT FIXTURES. 120VAC CEILING MOUNTED. SEE SPECIFICATIONS.		
KP	SECURITY GATE ACCESS KEYPAD MOUNTED 46" ABOVE FINISHED GRADE UNLESS OTHERWISE SPECIFIED BY OWNER.		
	ELECTRIC PUSH BUTTON IN FLUSH OUTLET BOX WHEN SHOWN IN FINISHED WALLS. MOUNT 46-INCHES ABOVE FINISHED FLOOR UNLESS OTHERWISE INDICATED OR REQUIRED BY SITE CONDITIONS. PROVIDED BY DOOR OPERATED VENDOR.		

NC ENERGY CONSERVATION CODE SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

METHOD OF COMPLIANCE:
ENERGY CODE: ☒ PRESCRIPTIVE ☐ PERFORMANCE
ASHRAE 90.1: ☒ PRESCRIPTIVE ☐ PERFORMANCE

LIGHTING SCHEDULE (EACH FIXTURE TYPE)

TOTAL INTERIOR WATTAGE ALLOWED VS SPECIFIED (WHOLE BUILDING METHOD)
ENCLOSED OFFICE 1.11 KW/SF VS 0.69 kW/SF

TOTAL EXTERIOR WATTAGE (ZONE 3) ALLOWED VS. SPECIFIED – 0.75 kW VS 0.09 kW

ADDITIONAL PRESCRIPTIVE COMPLIANCE

☐ 506.2.1 MORE EFFICIENT MECHANICAL EQUIPMENT
☒ 506.2.2 REDUCED LIGHTING POWER DENSITY
☐ 506.2.3 ENERGY RECOVERY VENTILATION SYSTEMS
☐ 506.2.4 HIGHER EFFICIENCY SERVICE WATER HEATING
☐ 506.2.5 ON-SITE SUPPLY OF RENEWABLE ENERGY
☐ 506.2.6 AUTOMATIC DAYLIGHTING CONTROL SYSTEMS

ABBREVIATIONS

A	AMPERES	G	GROUNDING CONDUCTOR
AFF	ABOVE FINISHED FLOOR	GF	GROUND FAULT CIRCUIT INTERRUPTER
AFG	ABOVE FINISHED GRADE	HP	HORSE POWER
ATS	AUTOMATIC TRANSFER SWITCH	LC	LIGHTING CONTACTOR
BAS	BUILDING AUTOMATION SYSTEM PANEL	N	NEUTRAL CONDUCTOR
C	CONDUIT	NL	NIGHT LIGHT
CATV	CABLE TELEVISION	P	POLE
Cd	CANDELA RATING	PIV	POST INDICATOR VALVE
CB	CIRCUIT BREAKER	REC	RECEPTACLE
CM	CEILING MOUNTED	SPD	SURGE PROTECTION DEVICE
EF	EXHAUST FAN	UC	UNDER COUNTER
ER	ELEVATOR RECALL	UNO	UNLESS NOTED OTHERWISE
EWC	ELECTRIC WATER COOLER	V	VOLTS
	CONNECTION WITH GROUND FAULT PROTECTION	VA	VOLT-AMPS
		W	WATTS, WIRES
FACP	FIRE ALARM CONTROL PANEL	WP	WEATHERPROOF
FPN	FUSED PER NAMEPLATE RATING	WG	WIRE GUARD

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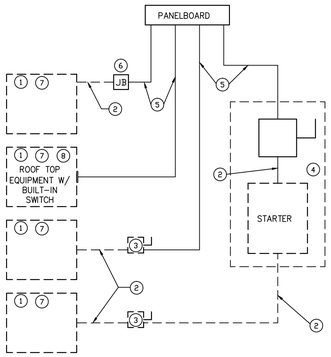
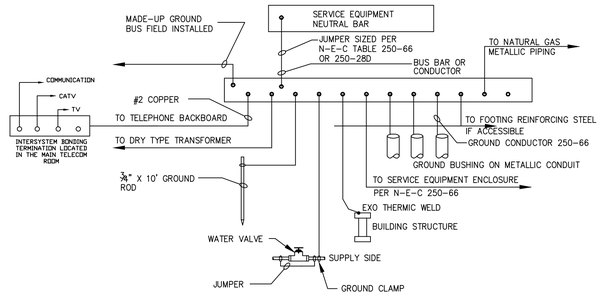


ELECTRICAL NOTES:

1. EQUIPMENT OF TRADES OTHER THAN ELECTRICAL.
2. CONDUIT & WIRING BY HVAC, PLUMBING CONTRACTOR OR OTHER TRADES.
3. IF AN ADDITIONAL DISCONNECT IS REQUIRED BY NEC, IT SHALL BE PROVIDED AND INSTALLED BY THE EQUIPMENT CONTRACTOR.
4. A COMBINATION STARTER OR VFD MAY BE USED IN LIEU OF A SEPARATE DISCONNECT SWITCH AND STARTER LOCATE ADJACENT TO EQUIPMENT.
5. FEEDER CIRCUIT WIRING AND CONDUIT IN ELECTRICAL WORK. SEE PANELBOARD SCHEDULES FOR WIRE AND BREAKER SIZES.
6. JUNCTION BOX MAY BE SHOWN ON ELECTRICAL PLANS FOR SOME EQUIPMENT IF NO STARTER OR DISCONNECT IS SUPPLIED, A JUNCTION BOX SHALL BE INSTALLED ADJACENT TO EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE LINE SIDE WIRING TO THE JUNCTION BOX, LOAD SIDE WIRING SHALL BE PROVIDED BY MECHANICAL CONTRACTOR OR OTHER TRADES.
7. IN ALL CASES, THE EQUIPMENT CONTRACTOR SHALL MAKE FINAL CONNECTIONS, START UP AND TEST EQUIPMENT.
8. IF THE ROOF TOP EQUIPMENT IS NOT PROVIDED WITH BUILT IN SWITCH, THE ELECTRICAL CONTRACTOR SHALL PROVIDE A DISCONNECT SWITCH.

1 E0.2 ELECTRICAL CONNECTION COORDINATION

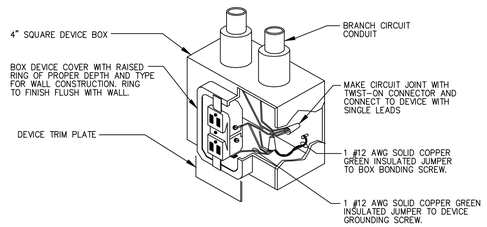
DIAGRAMMATIC



2 E0.2 SERVICE EQUIPMENT GROUNDING

SCALE : NOT TO SCALE

NOTE:
GROUND BUSBARS – 2"W X 12"L X 1/4"D (MIN.) CU. BUSBAR ON STANDOFF INSULATORS (TYP.)



4 E0.2 RECEPTACLE GROUNDING DETAIL

SCALE : NOT TO SCALE

LUMINAIRE SCHEDULE

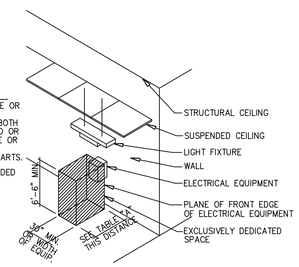
TYPE	MANUFACTURERS	CATALOG INFORMATION	LAMP DATA NO	LAMP DATA TYPE	BALLAST DATA* NO	BALLAST DATA* TYPE	INPUT WATTS	VOLTAGE	MOUNTING**	FIXTURE DESCRIPTION	REMARKS
Aa	LUMAX	LDELED SERIES	X	LED/3500'K	–	–	90	120	RECESSED	2'x4' TROFFER, ±9,000 LUMENS, STEEL HOUSING, BAKED WHITE ENAMEL FINISH, POST PAINTED, FLUSH STEEL DOOR, DIMMING DRIVER, ACRYLIC DIFFUSING LENS, UL DAMP LOCATION LABEL.	RECESSED IN GRID OR GYPBOARD CEILING. SEE ARCH. FINISH SCHEDULE FOR CEILING TYPE.
	WILLIAMS	50 SERIES									
	XELEUM	XBT122 SERIES									
	OR APPROVED	EQUIVALENT									
Ab	COOPER	GRLED	X	LED/3500K	1	DRIVER	70	UNIV.	RECESSED	2'X4' LED. TROFFER, STEEL HOUSING, BAKED WHITE ENAMEL FINISH, POST-PAINTED FLUSH ALUMINUM DOOR, 0.125" MINIMUM THK. A19 ACRYLIC LENS, 7200lm MIN.	
	LITHONIA	2VTL4									
	COLUMBIA	LCAT24									
Db	SPI STILE	LECR-C SERIES	X	LED/4000'K	–	–	45	120	SUSPENDED	4' LINEAR STRIP, 4" WIDE, DIFFUSING LENS, ±5,000 LUMENS, METAL HOUSING, UL DAMP LOCATION LABEL. PROVIDE WITH WIRE GUARD AND CHAIN HANGER SUPPORT HARDWARE.	SUSPENDED FROM METAL STRUCTURE IN CEILING, MOUNT HIGH ENOUGH AFF TO CLEAR GARAGE DOOR WHEN OPENED.
	WILLIAMS	75 SERIES									
	XELEUM	XASW02 SERIES									
	OR APPROVED	EQUIVALENT									
Ea	DUAL LITE	LX SERIES	1	LED	1	DRIVER	5	UNIV.	SURFACE	THERMO-PLASTIC LED EXIT SIGN, RED LETTERS, WHITE HOUSING, EMERGENCY BACKUP, MAINTENANCE-FREE SEALED NICKEL CADMIUM BATTERY, UNIV. VOLTAGE, UL LISTED.	MEETS OR EXCEEDS REQUIREMENTS OF UL 924, NFPA 70, NFPA 101 FOR 90 MIN. OPERATION. PROVIDE DOUBLE FACES, APPROPRIATE MOUNTING KITS FOR THE LOCATION, AND PUSH-OUT CHEVRONS INDICATING PATH OF EGRESS.
	SURE-LITES	CX SERIES									
	LITHONIA	LQC SERIES									
	CHLORIDE	55 LINE									
Eb	DUAL LITE	LZ SERIES	2	HALOGEN MR16	NA	NA	20	UNIV.	SURFACE	EMERGENCY BATTERY PACK, WHITE THERMOPLASTIC HOUSING, 6V MAINTENANCE-FREE SEALED NICKEL CADMIUM BATTERY, UNIV. VOLTAGE, UL LISTED.	MEETS OR EXCEEDS REQUIREMENTS OF UL 924, NFPA 70, NFPA 101 FOR 90 MIN. OPERATION.
	SURE-LITES	CC4 SERIES									
	LITHONIA	ELM SERIES									
	CHLORIDE	VAR SERIES									
Ed	LUMARK	XTOR	2	LED (4000'K)	1	DRIVER	18	120	SURFACE WALL	LED WALLPACK, REFRACTIVE LENS LUMINAIRE, 2 LEDS, FULL-CUTOFF, DIE-CAST AL. HOUSING, CARBON BRONZE FINISH, EMERG. COLD TEMP. POWER PACK., W/PE CELL.	MOUNT ABOVE DOOR FRAME. COORDINATE EXACT LOCATION WITH ARCHITECT PRIOR TO INSTALLATION.
	HUBBELL	LNC9L									
	PHILLIPS STONCO	WTN									
	LITHONIA	OLWX1									

UNIV. – UNIVERSAL VOLTAGE 120/277V

LUMINAIRE NOTES (APPLY TO ALL LUMINAIRES)

1. ELECTRICAL CONTRACTOR TO VERIFY EXACT LOCATION AND PLACEMENT OF LUMINAIRES WITH ARCHITECTURAL REFLECTED CEILING PLANS PRIOR TO ROUGH-IN OR RELOCATE THEM AT NO CHARGE.
2. CONTRACTOR SHALL PROVIDE SUITABLE TRIM AND APPURTENANCES TO MOUNT LUMINAIRES IN TYPE OF CEILING OR WALL AS SPECIFIED IN ARCHITECTURAL FINISH SCHEDULES REGARDLESS OF CATALOG NUMBER GIVEN. CONTRACTOR SHALL VERIFY TYPE OF CEILING OR WALL BY REVIEWING ARCH. FINISH SCHEDULES PRIOR TO ORDERING LUMINAIRES.
3. LUMINAIRES SHALL BE SUPPORTED FROM THE STRUCTURE AS STATED IN THE PROJECT SPECIFICATIONS, AND/OR SHOWN ON DETAIL. LUMINAIRE SUPPORTS SHALL COMPLY WITH PROJECT SEISMIC REQUIREMENTS. REQUIRED SUPPORTS SHALL BE FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR.
4. LUMINAIRES AS SPECIFIED HAVE BEEN SELECTED TO PROVIDE REQUIRED LEVELS OF ILLUMINATION, PERFORMANCE AND CONSTRUCTION FEATURES. ANY DEVIATIONS FROM SPECIFIED LUMINAIRES AND LIGHTING SPECIFICATIONS SHALL REQUIRE THE SUBMITTING AGENT AND CONTRACTOR RESPONSIBLE, FOR PROVING SUCH DEVIATION WILL PROVIDE EQUIVALENT PERFORMANCE AND CONSTRUCTION TO THE SPECIFIED LUMINAIRE AND SPECIFIED LIGHTING REQUIREMENTS.
5. MULTIPLE LUMINAIRES SWITCHED TOGETHER MAY BE FACTORY TANDEM WIRED WITH 2, 3, & 4 LAMP BALLAST. NO SINGLE LAMP BALLAST ALLOWED UNLESS SPECIFICALLY SCHEDULED. INDIVIDUAL FLUORESCENT LUMINAIRES SHALL BE EQUIPPED WITH ONE BALLAST WITH ABILITY TO SPLIT SWITCH LAMPING IN EACH LUMINAIRE. SWITCH ONE BALLAST IN LUMINAIRE TO PROVIDE HALF (ONE-THIRD, TWO-THIRD) OR FULL ILLUMINATION OF AREAS INDICATED. WIRE SUCH THAT ONE SWITCH CONTROLS INSIDE LAMPS OF LUMINAIRE AND OTHER SWITCH CONTROLS OUTSIDE LAMPS. TYPICAL AS NOTED OR AS REQUIRED BY NORTH CAROLINA STATE BUILDING ENERGY CODE, CHAPTER 8. CONTRACTOR SHALL BE RESPONSIBLE FOR LUMINAIRE COUNTS.
6. CONTRACTOR SHALL VERIFY VOLTAGE AVAILABLE IN EACH AREA, AND FURNISH LUMINAIRES AT VOLTAGE OF CIRCUIT PROVIDED.
7. SEE PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS FOR EXIT AND EGRESS LUMINAIRES.
8. ALL RECESSED LUMINAIRES INSTALLED IN CEILINGS, INDICATED BY ARCH. AS HAVING INSULATION INSTALLED OVER CEILING AND FIXTURES, SHALL BE U.L. RATED FOR DIRECT CONTACT WITH INSULATION. VERIFY WITH ARCHITECTURAL PLANS.
9. ALL LUMINAIRES RECESSED IN FIRE RATED CEILINGS, SHALL BE INSTALLED WITH AN APPROVED TENT ENCLOSURE BY G/C, OR BE U.L. RATED FOR USE IN FIRE RATED CEILINGS. VERIFY WITH ARCHITECTURAL PLANS, AND COORDINATE WITH G/C BEFORE INSTALLATION OF LUMINAIRES.
10. LUMINAIRES SHALL BE EQUIPPED WITH PROGRAMMED START BALLASTS, WHERE LUMINAIRES ARE CONTROLLED BY OCCUPANCY SENSORS AS INDICATED ON PLANS.
11. LUMINAIRES WITH FLUORESCENT BALLASTS OR LED DRIVERS WHERE SHOWN MUST BE COMPATIBLE WITH DIMMING CONTROLS PROVIDED.
12. AREAS PROVIDED WITH FLUORESCENT LUMINAIRES AND DUAL LEVEL SWITCH CONTROLS WILL REQUIRE A COMBINATION OF TWO LAMP BALLAST AND ONE BALLAST. SAME AREAS PROVIDED WITH LED LUMINAIRES WILL REQUIRE 50% STEP DIMMING DRIVERS.

TABLE A – WORKING CLEARANCES			
VOLTAGE TO GROUND NOM.	MINIMUM CLEAR DISTANCE (FEET) CONDITION:	1	2	3
0 – 150		3	3	3
151 – 600		3	3.5	4



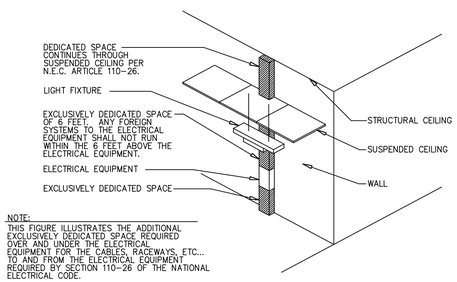
WHERE THE "CONDITIONS" ARE AS FOLLOWS:

1. EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUNDED PARTS ON THE OTHER SIDE OF THE WORKING SPACE, OR EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS. INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300V SHALL NOT BE CONSIDERED LIVE PARTS.
2. EXPOSED LIVE PARTS ON ONE SIDE AND GROUNDED PARTS ON THE OTHER SIDE.
3. EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORK SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

NOTE:
THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF THE ELECTRICAL EQUIPMENT REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

3 E0.2 ELECTRICAL EQUIPMENT WORKING CLEARANCE

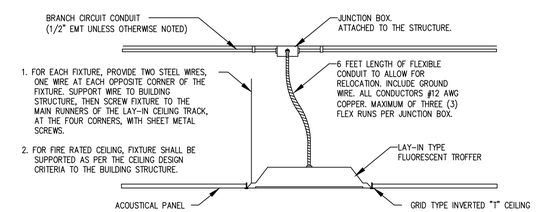
SCALE : NOT TO SCALE



NOTE:
THIS FIGURE ILLUSTRATES THE ADDITIONAL EXCLUSIVELY DEDICATED SPACE REQUIRED OVER AND UNDER THE ELECTRICAL EQUIPMENT FOR THE CABLES, RACEWAYS, ETC... TO AND FROM THE ELECTRICAL EQUIPMENT REQUIRED BY SECTION 110-26 OF THE NATIONAL ELECTRICAL CODE.

5 E0.2 ELECTRICAL EQUIPMENT DEDICATED SPACE

SCALE : NOT TO SCALE



6 E0.2 RECESSED LIGHTING FIXTURE MOUNTING DETAIL

SCALE : NOT TO SCALE

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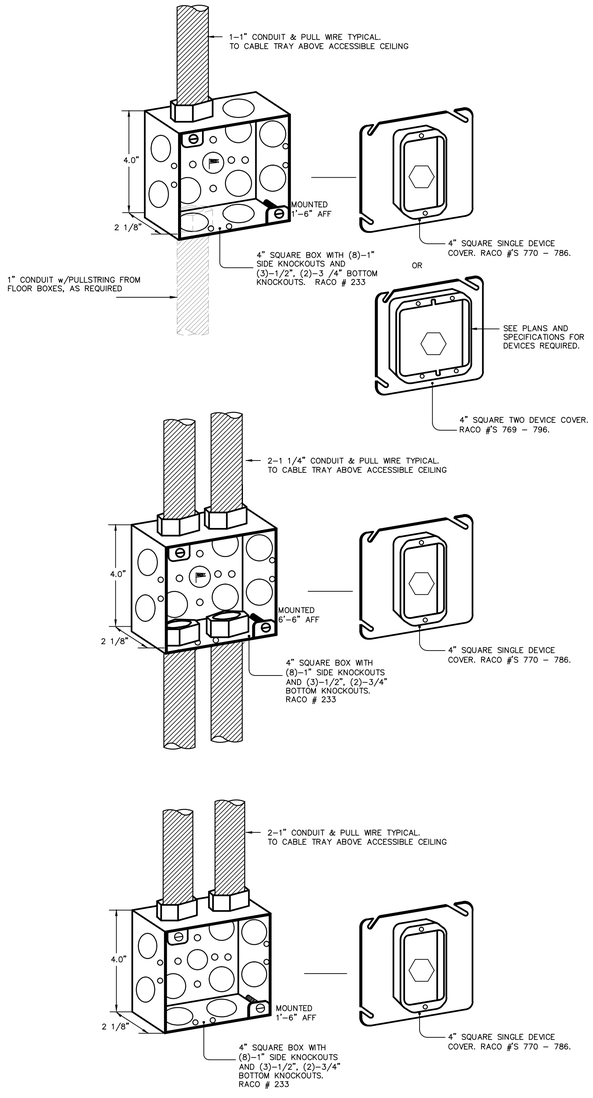


OTHER ACCEPTABLE MANUFACTURERS ARE APPLETON, T&B, AND MIDLAND ROSS/STEEL CITY

1 E0.3 TELE/DATA OUTLET BOX DETAIL

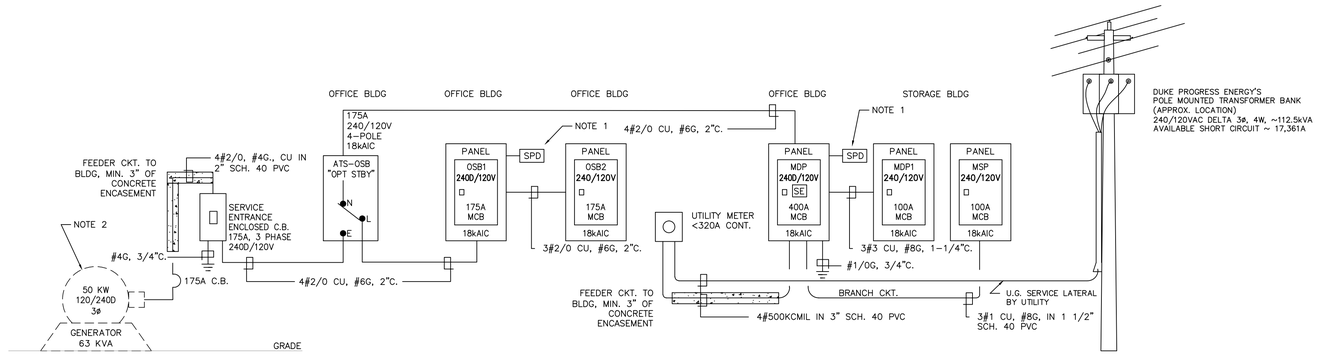
SCALE : NOT TO SCALE

NOTES:

1. CONTRACTOR PROVIDE WALL BOXES AND CONDUIT ONLY. CONDUIT TO EXTEND AND TURN OUT ABOVE CEILING OR AN ACCESSIBLE SPACE ABOVE ADJACENT CEILING. 3/4"C. MIN.: PHONE/DATA CABLING BY OWNER.

2. BOX AND RING NUMBERS SHOWN FOR STUD WALL CONSTRUCTION,

3. SUBSTITUTE MASONRY BOX EQUIVALENT WHERE LOCATED IN CMU OR CONCRETE WALLS.



2 E0.3 ELECTRICAL RISER DIAGRAM - OFFICE AND STORAGE BUILDING

SCALE : NOT TO SCALE

NOTES:

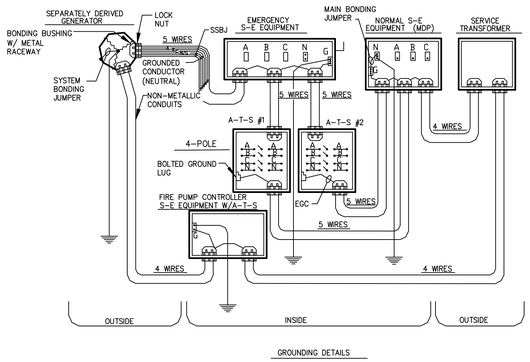
1. SURGE SUPPRESSOR, 100KA PER MODE/200KA PER PHASE, 10 YEAR WARRANTY, #8 WIRE AS SHORT AS POSSIBLE VIA 50A/3P CIRCUIT BREAKER

2. DIESEL GENERATOR IS FOR OPTIONAL STANDBY POWER ONLY. GENERATOR IS EXISTING AT ANOTHER SITE, AND WILL BE RELOCATED TO THIS SITE BY OWNER.

3. UNLESS ROUTED UNDER A MINIMUM OF A 4 INCH CONCRETE BUILDING SLAB ALL UNDERGROUND ELECTRICAL SERVICES AND FEEDERS SHALL BE CONCRETE ENCASED WITH A MINIMUM OF 3 INCHES.

4. ALL UNDERGROUND ELECTRICAL CONDUITS SHALL HAVE MARKER TAPE 6 INCHES BELOW FINISHED GRADE.

5. CONTRACTOR MAY REUSE EXISTING TRANSFER SWITCH IF IT IS RATED 175A OR LARGER AND MEETS THE REQUIREMENTS SHOWN ON THE RISER DIAGRAM. IF IT DOES NOT MEET THESE REQUIREMENTS, USE SPECIFICATION 263213 SECTION 2.6 TO SELECT NEW TRANSFER SWITCH.



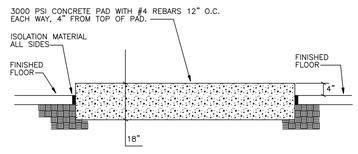
GROUNDING DETAILS

3 E0.3 EMERGENCY GENERATOR

SCALE : NOT TO SCALE

DETAIL #3 NOTES:

1. GENERATOR WILL BE RELOCATED FROM ANOTHER LOCATION AT THIS SITE BY OWNER.
2. GENERATOR SHALL BE PROVIDED WITH CIRCUIT BREAKERS.
3. (SSB) SUPPLY–SIDE BONDING JUMPER PER250–102C.
4. ⏚ DENOTES GROUNDING ELECTRODE TO THE STEEL FRAME OF THE BLDG. WHERE PROVEN TO BE SUITABLY GROUNDED, THE METALLIC WATER MAIN AND THE GROUND ROD.
5. BATTERY CHARGER & BLOCK HEATER SHALL BE FED FROM THE EMERGENCY PANEL.
6. EQUIPMENT SHALL BE GROUNDED PER 250–32B.
7. ELECTRICAL CONTRACTOR SHALL TEST AND VERIFY PROPER OPERATION OF THE GENERATOR AND AUTOMATIC TRANSFER SWITCH UNDER CONNECTED LOAD AFTER INSTALLATION.
8. ELECTRICAL CONTRACTOR SHALL REFILL FUEL TANK AFTER ALL TESTING AND FINAL INSPECTION.



4 E0.3 GENERATOR PAD DETAIL

SCALE : NOT TO SCALE

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PANELBOARD OSB1

SERVED FROM: MDP | AMPERE RATING: 225 A | VOLTAGE (L-L): 240 HIGH EG | PHASE: 3 | 18 ,000 MINIMUM RMS
ENCLOSURE RATING: NEMA 1 | MAIN BREAKER: 175 A | VOLTAGE (L-N): 120 | WIRE: 4 | SYMMETRICAL AIC RATING
MOUNTING: RECESSED | LUG OPTIONS: M.C.B. | LOCATION: CORRIDOR

CIR. NO.	LOAD DESCRIPTION	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	PHASE SIZE	G SIZE	CND IN.	BRKR RTG/P	
1	SPACE ONLY											A
3	N/A FOR 120V 1 PHASE LOADS											B
5	SPACE ONLY											C
7	SPACE ONLY											A
9	N/A FOR 120V 1 PHASE LOADS											B
11	SPACE ONLY											C
13	SPACE ONLY											A
15	N/A FOR 120V 1 PHASE LOADS											B
17	SPACE ONLY											C
19	SPACE ONLY											A
21	N/A FOR 120V 1 PHASE LOADS											B
23	SPACE ONLY											C
25	SPACE ONLY											A
27	N/A FOR 120V 1 PHASE LOADS											B
29	SPACE ONLY											C
31	SPACE ONLY											A
33	N/A FOR 120V 1 PHASE LOADS											B
35	SPACE ONLY											C
37						0.10	6					A
39	SPD					0.10	6	10	1	50/3		B
41						0.10	6					C

BRKR RTG/P	PHASE SIZE	G SIZE	CND IN.	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	LOAD DESCRIPTION	CIR. NO.
										SPACE ONLY	2
										N/A FOR 120V 1 PHASE LOADS	4
										SPACE ONLY	6
										SPACE ONLY	8
										N/A FOR 120V 1 PHASE LOADS	10
										SPACE ONLY	12
										SPACE ONLY	14
										N/A FOR 120V 1 PHASE LOADS	16
										SPACE ONLY	18
										SPACE ONLY	20
										N/A FOR 120V 1 PHASE LOADS	22
										SPACE ONLY	24
										SPACE ONLY	26
										N/A FOR 120V 1 PHASE LOADS	28
										SPACE ONLY	30
										SPACE ONLY	32
										N/A FOR 120V 1 PHASE LOADS	34
175/2	SEE RISER DIAGRAM			1.13	1.25	5.33	0.00	7.33	0.10	OSB2	36
				1.39	1.25	5.76	0.00	5.94	2.01		38
										N/A FOR 120V 1 PHASE LOADS	40
										SPACE ONLY	42

PANELBOARD NOTES:
1. PROVIDE WITH COPPER BUSSES.
2. DO NOT USE PHASE "B" FOR 120V SINGLE PHASE LOADS

LARGEST MOTOR (KVA): 3.60

LOAD TOTALS (KVA):	CONNECTED	DEMAND
LIGHTING/CONTINUOUS	2.52	2.52
HEATING/COOLING	2.50	2.50
MOTORS	11.09	11.09
KITCHEN	0.00	0.00
RECEPTACLES	13.27	11.64
MISCELLANEOUS	2.41	2.41
TOTAL	31.79	31.06

LOAD BALANCE
PHASE A 155.24%
PHASE B 0.94%
PHASE C 143.82%

TOTAL DEMAND AMPS x 75
LARGEST UNBALANCE PHASE %: 1.5524

LARGEST UNBALANCE PHASE AMPS: 115.97

PANELBOARD OSB2

SERVED FROM: OSB1 | AMPERE RATING: 225 A | VOLTAGE (L-L): 240 | PHASE: 1 | 18 ,000 MINIMUM RMS
ENCLOSURE RATING: NEMA 1 | MAIN BREAKER: 175 A | VOLTAGE (L-N): 120 | WIRE: 3 | SYMMETRICAL AIC RATING
MOUNTING: RECESSED | LUG OPTIONS: M.C.B. | LOCATION: CORRIDOR

CIR. NO.	LOAD DESCRIPTION	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	WIRE SIZE	G SIZE	CND IN.	BRKR RTG/P	
1	LTG - OFFICES	0.72						12	12	1/2	20/1	A
3	LTG - OFFICES	0.85						12	12	1/2	20/1	C
5	LTG - CORRIDOR	0.35						12	12	1/2	20/1	A
7	LTG - ASSEMBLY	0.54						12	12	1/2	20/1	C
9	EXTERIOR LTG	0.06						12	12	1/2	20/1	A
11	RECEPTACLES - MECH ROOM					0.72		12	12	1/2	20/1	C
13	RECEPTACLES - CORRIDOR					0.90		12	12	1/2	20/1	A
15	EF-1			0.86				12	12	1/2	20/1	C
17	EF-2			0.43				12	12	1/2	20/1	A
19	EF-4			2.40				12	12	1/2	20/1	C
21	RECEPTACLES - BREAK ROOM					0.54		12	12	1/2	20/1	A
23	RP-1 PUMP			0.70				12	12	1/2	20/1	C
25	RECEPTACLES - BREAK ROOM					0.36		12	12	1/2	20/1	A
27	REFRIGERATOR					0.70		12	12	1/2	20/1	C
29	TELEPHONE SYSTEM					1.00		12	12	1/2	20/1	A
31	DATA NETWORK					1.00		12	12	1/2	20/1	C
33	RP-D1 PUMP			0.70				12	12	1/2	20/1	A
35	GRINDER PUMP			1.80				10	10	3/4	30/2	C
37				1.80				10				A
39	SPARE										20/1	C
41	SPARE										20/1	A

BRKR RTG/P	WIRE SIZE	G SIZE	CND IN.	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	LOAD DESCRIPTION	CIR. NO.
20/1	12	12	1/2						0.90	RECEPTACLES - ASSEMBLY	2
20/1	12	12	1/2						1.08	RECEPTACLES - OFFICE	4
20/1	12	12	1/2						0.72	RECEPTACLES - OFFICE	6
20/1	12	12	1/2						0.72	RECEPTACLES - OFFICE	8
20/1	12	12	1/2						0.72	RECEPTACLES - OFFICE	10
20/1	12	12	1/2						0.72	RECEPTACLES - OFFICE	12
20/1	12	12	1/2						0.10	SMOKE DETECTOR PWR	14
20/1	12	12	1/2						1.00	BAS CONTROL PANEL	16
20/1	12	12	1/2						0.75	ELECTRIC WATER COOLER	18
20/1	12	12	1/2						0.15	WH-1 WATER HEATER	20
30/1	10	10	3/4			2.40				MOTORIZED GATE	22
20/1	12	12	1/2						1.86	B-1 BOILER	24
20/1	12	12	1/2						1.44	ICE MACHINE	26
20/2	12	12	1/2			1.25				CABINET HEATER	28
						1.25					30
25/2	12	10	3/4			2.00				EUH-1 UNIT HEATER	32
						2.00					34
										SPACE ONLY	36
										SPACE ONLY	38
										SPACE ONLY	40
										SPACE ONLY	42

PANELBOARD NOTES:
1. PROVIDE WITH COPPER BUSSES.

LARGEST MOTOR (KVA): 3.60

LOAD TOTALS (KVA):	CONNECTED	DEMAND
LIGHTING/CONTINUOUS	2.52	3.15
HEATING/COOLING	6.50	6.50
MOTORS	11.09	11.99
KITCHEN	0.00	0.00
RECEPTACLES	13.27	11.64
MISCELLANEOUS	2.11	2.11
TOTAL	35.49	35.39

LOAD BALANCE
PHASE A 96.59%
PHASE C 103.41%

TOTAL DEMAND AMPS x 147
LARGEST UNBALANCE PHASE %: 1.0341

LARGEST UNBALANCE PHASE AMPS: 152.46

PANELBOARD MDP

SERVED FROM: UTILITY | AMPERE RATING: 400 A | VOLTAGE (L-L): 240 HIGH EG | PHASE: 3 | 18 ,000 MINIMUM RMS
ENCLOSURE RATING: NEMA 1 | MAIN BREAKER: 400 A | VOLTAGE (L-N): 120 | WIRE: 4 | SYMMETRICAL AIC RATING
MOUNTING: RECESSED | LUG OPTIONS: M.C.B. | LOCATION: CORRIDOR

CIR. NO.	LOAD DESCRIPTION	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	PHASE SIZE	G SIZE	CND IN.	BRKR RTG/P	
1	SPACE ONLY											A
3	N/A FOR 120V 1 PHASE LOADS											B
5	SPACE ONLY											C
7	SPACE ONLY											A
9	N/A FOR 120V 1 PHASE LOADS											B
11	SPACE ONLY											C
13	SPACE ONLY											A
15	N/A FOR 120V 1 PHASE LOADS											B
17	SPACE ONLY											C
19	SPACE ONLY											A
21	N/A FOR 120V 1 PHASE LOADS											B
23	SPACE ONLY											C
25	SPACE ONLY											A
27	N/A FOR 120V 1 PHASE LOADS											B
29	SPACE ONLY											C
31		1.39	1.25	5.76	0.00	5.94	2.11					A
33	PANEL OSB1 via ATS	0.00	0.00	0.00	0.00	0.00	0.10	SEE RISER DIAGRAM			175/3	B
35		1.13	1.25	5.33	0.00	7.33	0.20					C
37							0.10	6				A
39	EXTERNAL SPD						0.10	6	10	1	50/3	B
41							0.10	6				C

BRKR RTG/P	PHASE SIZE	G SIZE	CND IN.	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	LOAD DESCRIPTION	CIR. NO.
	12			2.16							2
20/3	12	12	1/2	2.16						AHU-1	4
	12			2.16							6
	6			4.77							8
50/3	6	10	1	4.77						CU-1	10
	6			4.77							12
										SPACE ONLY	14
										N/A FOR 120V 1 PHASE LOADS	16
										SPACE ONLY	18
										SPACE ONLY	20
										N/A FOR 120V 1 PHASE LOADS	22
										SPACE ONLY	24
										SPACE ONLY	26
										N/A FOR 120V 1 PHASE LOADS	28
100/2	SEE RISER DIAGRAM			#REF!	#REF!	#REF!	#REF!	#REF!	#REF!	MDP1	30
				#REF!	#REF!	#REF!	#REF!	#REF!	#REF!		32
										N/A FOR 120V 1 PHASE LOADS	34
100/2	SEE RISER DIAGRAM			0.30	0.00	0.70	0.00	1.80	0.00	PANEL MSP (STORAGE BLDG)	36
				0.30	0.00	1.13	0.00	1.90	0.00		38
										N/A FOR 120V 1 PHASE LOADS	40
										SPACE ONLY	42

PANELBOARD NOTES:
1. DELTA HIGH LEG PANELBOARD.
2. PROVIDE WITH COPPER BUSSES.
3. SERVICE ENTRANCE RATED
4. DO NOT USE PHASE "B" FOR 120V 1 PHASE LOADS

LARGEST MOTOR (KVA): 3.60

LOAD TOTALS (KVA):	CONNECTED	DEMAND
LIGHTING/CONTINUOUS	#REF!	#REF!
HEATING/COOLING	#REF!	#REF!
MOTORS	#REF!	#REF!
KITCHEN	#REF!	#REF!
RECEPTACLES	#REF!	#REF!
MISCELLANEOUS	#REF!	#REF!
TOTAL	#REF!	#REF!

LOAD BALANCE
PHASE A #REF!
PHASE B #REF!
PHASE C #REF!

TOTAL DEMAND AMPS x #REF!
LARGEST UNBALANCE PHASE %: #REF!

LARGEST UNBALANCE PHASE AMPS: #REF!

PANELBOARD MDP1

SERVED FROM: MDP | AMPERE RATING: 100 A | VOLTAGE (L-L): 240 | PHASE: 1 | 18 ,000 MINIMUM RMS
ENCLOSURE RATING: NEMA 1 | MAIN BREAKER: 100 A | VOLTAGE (L-N): 120 | WIRE: 3 | SYMMETRICAL AIC RATING
MOUNTING: RECESSED | LUG OPTIONS: M.C.B. | LOCATION: CORRIDOR

CIR. NO.	LOAD DESCRIPTION	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	WIRE SIZE	G SIZE	CND IN.	BRKR RTG/P	
1	RECEPTACLES - ENTRY					0.54		12	12	1/2	20/1	A
3	RECEPTACLES - STORAGE					0.72		12	12	1/2	20/1	C
5	RECEPTACLES					0.54		12	12	1/2	20/1	A
7	GEN BATTERY CHARGER						1.20	12	12	3/4	20/1	C
9	GEN BATTERY HEATER						1.20	12	12	3/4	20/1	A
11	GEN RECEPTACLE					0.18		12	12	3/4	20/1	C
13	GRINDER CONTROL PANEL						1.20	12	12	3/4	20/1	A
15	SPARE										20/1	C
17	SPARE										20/1	A
19	SPACE ONLY											C
21	SPACE ONLY											A
23	SPACE ONLY											C
25	SPACE ONLY											A
27	SPACE ONLY											C
29	SPACE ONLY											A
31	SPACE ONLY											C
33	SPACE ONLY											A
35	SPACE ONLY											C
37	SPACE ONLY											A
39	SPACE ONLY											C
41	SPACE ONLY											A

BRKR RTG/P	WIRE SIZE	G SIZE	CND IN.	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	LOAD DESCRIPTION	CIR. NO.
40/2	8	10	3/4					5.30		STOVE	2
	8							5.30			4
20/1	12	12	1/2					0.20		RANGE HOOD FAN	6
20/2	12	12	3/4						0.75	GEN JACKET HEATER	8
	12								0.75		10
20/1										SPARE	12
20/1										SPARE	14
20/1										SPARE	16
20/1										SPACE ONLY	18
20/1										SPACE ONLY	20
20/1										SPACE ONLY	22
20/1										SPACE ONLY	24
20/1										SPACE ONLY	26
20/1										SPACE ONLY	28
20/1										SPACE ONLY	30
20/1										SPACE ONLY	32
20/1										SPACE ONLY	34
20/1										SPACE ONLY	36
20/1										SPACE ONLY	38
20/1										SPACE ONLY	40
20/1										SPACE ONLY	42

PANELBOARD NOTES:
1. PROVIDE WITH COPPER BUSSES.

LARGEST MOTOR (KVA): 0.00

LOAD TOTALS (KVA):	CONNECTED	DEMAND
LIGHTING/CONTINUOUS	0.00	0.00
HEATING/COOLING	0.00	0.00
MOTORS	0.00	0.00
KITCHEN	10.80	10.80
RECEPTACLES	1.98	1.98
MISCELLANEOUS	5.10	5.10
TOTAL	17.88	17.88

LOAD BALANCE
PHASE A 108.84%
PHASE C 91.16%

TOTAL DEMAND AMPS x 75
LARGEST UNBALANCE PHASE %: 1.0884

LARGEST UNBALANCE PHASE AMPS: 81.08

PANELBOARD MSP

SERVED FROM: MDP | AMPERE RATING: 125 A | VOLTAGE (L-L): 240 D | PHASE: 1 | 18 ,000 MINIMUM RMS
ENCLOSURE RATING: NEMA 1 | MAIN BREAKER: 100 A | VOLTAGE (L-N): 120 | WIRE: 3 | SYMMETRICAL AIC RATING
MOUNTING: SURFACE | LUG OPTIONS: M.C.B. | LOCATION: STORAGE BUILDING

CIR. NO.	LOAD DESCRIPTION	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	WIRE SIZE	G SIZE	CND IN.	BRKR RTG/P	
1	LIGHTING	0.20						12	12	1/2	20/1	A
3	LIGHTING	0.30						12	12	1/2	20/1	C
5	EXTERIOR LIGHTING	0.10						12	12	1/2	20/1	A
7	EF-3			0.43				12	12	1/2	20/1	C
9	UH-1			0.70				12	12	1/2	20/1	A
11	UH-2			0.70				12	12	1/2	20/1	C
13	SPARE										20/1	A
15	SPARE										20/1	C
17	SPACE ONLY											A
19	SPACE ONLY											C
21	SPACE ONLY											A
23	SPACE ONLY											C
25	SPACE ONLY											A
27	SPACE ONLY											C
29	SPACE ONLY											A
31	SPACE ONLY											C
33	SPACE ONLY											A
35	SPACE ONLY											C
37	SPACE ONLY											A
39	SPACE ONLY											C
41	SPACE ONLY											A

BRKR RTG/P	WIRE SIZE	G SIZE	CND IN.	LOAD (KVA) LTG	H/C	MOT	KIT	REC	MISC	LOAD DESCRIPTION	CIR. NO.
20/1	12	12	1/2					0.72		RECEPTACLES	2
20/1	12	12	1/2					0.72		RECEPTACLES	4
20/1	12	12	1/2					0.72		RECEPTACLES	6
20/1	12	12	1/2					1.18		GARAGE DOOR OPENER	8
20/1	12	12	1/2					0.36		RTC EXTERIOR	10
20/1										SPARE	12
20/1										SPARE	14
20/1										SPARE	16
										SPACE ONLY	18
										SPACE ONLY	20
										SPACE ONLY	22
										SPACE ONLY	24
										SPACE ONLY	26
										SPACE ONLY	28
										SPACE ONLY	30
										SPACE ONLY	32
										SPACE ONLY	34
										SPACE ONLY	36
										SPACE ONLY	38
										SPACE ONLY	40
										SPACE ONLY	42

PANELBOARD NOTES:
1. PROVIDE WITH COPPER BUSSES.

LARGEST MOTOR (KVA): 0.00

LOAD TOTALS (KVA):	CONNECTED	DEMAND
LIGHTING/CONTINUOUS	0.60	0.75
HEATING/COOLING	0.00	0.00
MOTORS	1.83	1.83
KITCHEN	0.00	0.00
RECEPTACLES	3.70	3.70
MISCELLANEOUS	0.00	0.00
TOTAL	6.13	6.28

LOAD BALANCE
PHASE A 91.35%
PHASE C 108.65%

TOTAL DEMAND AMPS x 26
LARGEST UNBALANCE PHASE %: 1.0865

LARGEST UNBALANCE PHASE AMPS: 28.43

NORTH CAROLINA PROFESSIONAL SEAL 030422 ENGINEER THOMAS P. BUFFORD 10/18/16

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Designed DFR Drawn DAC
Checked DFR Date 10/18/16
Project No. 07002-0002

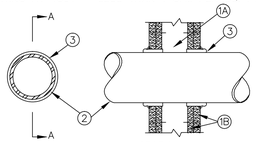
architectural design studio
70 Wall Street, Asheville, NC 28801 m@ads-architects.com Ph: 828.252.0355

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

SYSTEM NO. W-L-1001

JUNE 15, 2005

F RATINGS – 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)
T RATINGS – 0, 1, 2, 3 AND 4 HR (SEE ITEM 3)
L RATING AT AMBIENT – LESS THAN 1 CFM PER SQ. FT.
L RATING AT 400°F – LESS THAN 1 CFM PER SQ. FT.



SECTION A–A

1. WALL ASSEMBLY – THE 1, 2, 3 OR 4 HR FIRE–RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

A. STUDS – WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 H FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (406 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3–5/8 IN. (92 MM) WIDE BY 1–3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

B. GYPSUM BOARD* – NOM 1/2 OR 5/8 IN. (13 OR 16 MM) THICK, 4 FT. (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 26 IN. (660 MM).

2. THROUGH–PENETRANT – ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN 0 IN. / (0 MM). (POINT CONTACT) TO MAX 2 IN. (51 MM) PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

A. STEEL PIPE –– NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.

B. IRON PIPE – NOM 24 IN. (610 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.

C. CONDUIT – NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.

D. COPPER TUBING – NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.

E. COPPER PIPE – NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.

F. THROUGH PENETRATING PRODUCT* – FLEXIBLE METAL PIPING THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:

1. NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

OMEGA FLEX INC

2. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

TITEFLEX CORP A BUNDY CO

3. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.

WARD MFG INC

3. FILL, VOID OR CAVITY MATERIAL* – CAULK OR SEALANT– MIN 5/8, 1–1/4, 1–7/8 AND 2–1/2 IN. (16, 32, 48 AND 64 MM) THICKNESS OF CAULK FOR 1, 2, 3 AND 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW:

MAX PIPE OR CONDUIT DIAM IN (MM)	F RATING HR.	T RATING HR.
1 (25)	1 OR 2	0+, 1 OR 2
1 (25)	3 OR 4	3 OR 4
4 (102)	1 OR 2	0
6 (152)	3 OR 4	0
12 (305)	1 OR 2	0

+ WHEN COPPER PIPE IS USED, T RATING IS 0 H.
3M COMPANY – CP 25WB+ OR FB–3000 WT.
* BEARING THE UL CLASSIFICATION MARK.

1 E0.5 UL DETAIL- 1,2, & 3 HOUR GYPBOARD PENETRATION

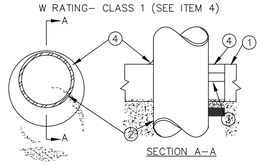
SCALE : NOT TO SCALE

SYSTEM NO. C-AJ-1001

MARCH 05, 2007

F RATING – 3 HR
T RATING – 0 HR

W RATING– CLASS 1 (SEE ITEM 4)



SECTION A–A

1. FLOOR OR WALL ASSEMBLY – MIN 4–1/2 IN. (114 MM) THICK LIGHTWEIGHT OR NORMAL WEIGHT (100–150 PCF OR 1600–2400 KG/M3) CONCRETE. WALL MAY ALSO BE CONSTRUCTED OF ANY UL CLASSIFIED CONCRETE BLOCKS*. MAX DIAM OF CIRCULAR THROUGH OPENING IS 32–1/2 IN. (826 MM).

1A. STEEL SLEEVE – (OPTIONAL, NOT SHOWN) – NOM 12 IN. (305 MM) DIAM (OR SMALLER) SCHEDULE 40 (OR HEAVIER) STEEL PIPE SLEEVE CAST INTO CONCRETE FLOOR OR WALL. SLEEVE TO BE FLUSH WITH OR PROJECT MAX 2 IN. (51 MM) FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF WALL. AS AN ALTERNATE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) SLEEVE FABRICATED FROM NOM 0.019 IN. (0.48 MM) THICK GALV STEEL CAST OR GROUTED INTO FLOOR OR WALL ASSEMBLY FLUSH WITH FLOOR OR WALL SURFACES.

2. THROUGH – PENETRANT – ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN OF 0 IN. (0 MM, POINT CONTACT) TO MAX 1–3/8 IN. (35 MM) PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS, OR TUBING MAY BE USED:

A. STEEL PIPE – NOM 30 IN. (762 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
A1. IRON PIPE – NOM 30 IN. (762 MM) DIAM (OR SMALLER) CAST OR DUCTILE IRON PIPE.
B. CONDUIT – NOM 6 IN. (152 MM) DIAM (OR SMALLER) RIGID STEEL CONDUIT.
C. CONDUIT – NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.

3. PACKING MATERIAL – POLYETHYLENE BACKER ROD OR NOM 1 IN. (25 MM) THICKNESS OF TIGHTLY–PACKED CERAMIC (ALUMINA SILICA) FIBER BLANKET, MINERAL WOOL BATT OR GLASS FIBER INSULATION MATERIAL USED AS A PERMANENT FORM. PACKING MATERIAL TO BE RECESSED FROM TOP SURFACE OF FLOOR OR FROM BOTH SURFACES OF SOLID CONCRETE OR CONCRETE BLOCK WALL AS REQUIRED TO ACCOMMODATE THE REQUIRED THICKNESS OF CAULK FILL MATERIAL (ITEM 4). AS AN ALTERNATE WHEN MAX PIPE SIZE IS 10 IN. (254 MM) DIAM AND WHEN MAX ANNULAR SPACE IS 1 IN. (25 MM), A MIN 1 IN. (25 MM) THICKNESS OF TIGHTLY–PACKED CERAMIC FIBER BLANKET OR MINERAL WOOL BATT PACKING MATERIAL MAY BE RECESSED MIN 1/2 IN. (13 MM) FROM BOTTOM SURFACE OF FLOOR OR FROM EITHER SIDE OF SOLID CONCRETE WALL.

4. FILL, VOID OR CAVITY MATERIALS* – CAULK – APPLIED TO FILL THE ANNULAR SPACE TO THE MIN THICKNESS SHOWN IN THE FOLLOWING TABLE:

MAX PIPE DIAM IN.	MAX ANNULAR SPACE IN.	PACKING MTL TYPE (a)	MIN. CAULK THKNS IN
10 (254)	1 (25)	BR, CF, GF or MW	1/2 (13) (b)
10 (254)	1 (25)	CF or MW	1/2 (13) (c)
30 (762)	2–1/2 (64)	BR, CF, GF or MW	1 (25) (b)

(a) BR= POLYETHYLENE BACKER ROD.
CF= CERAMIC FIBER BLANKET.
GF= GLASS FIBER INSULATION.
MW= MINERAL–WOOL BATT
(b) CAULK INSTALLED FLUSH WITH TOP SURFACE OF FLOOR OR BOTH SURFACES OF WALL
(c) CAULK INSTALLED FLUSH WITH BOTTOM SURFACE OF FLOOR OR ONE SURFACE OF SOLID (NON–CONCRETE BLOCK) WALL.

3M COMPANY– TYPE CP 25WB+ OR FB–3000 WT.

(NOTE– W RATING APPLIES ONLY WHEN FB–3000 WT IS USED ON TOP SURFACE OF FLOOR AND WHEN IT LAPS ONTO CONCRETE FOR SLEEVED OPENING.)

* BEARING THE UL CLASSIFICATION MARK.

2 E0.5 UL DETAIL- 1,2, & 3 HOUR CONCRETE PENETRATION

SCALE : NOT TO SCALE

NORTH CAROLINA PROFESSIONAL SEAL 030422 ENGINEER THOMAS P. BUFFORD
10/18/16

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Designed DFR Drawn DAC
Checked DFR Date 10/18/16
Project No. 07002–0002

Division 13 Maintenance/Bridge Maintenance Assembly Office
Department. of Transportation, Raleigh, NC SCO # 141126301A

architectural design studio
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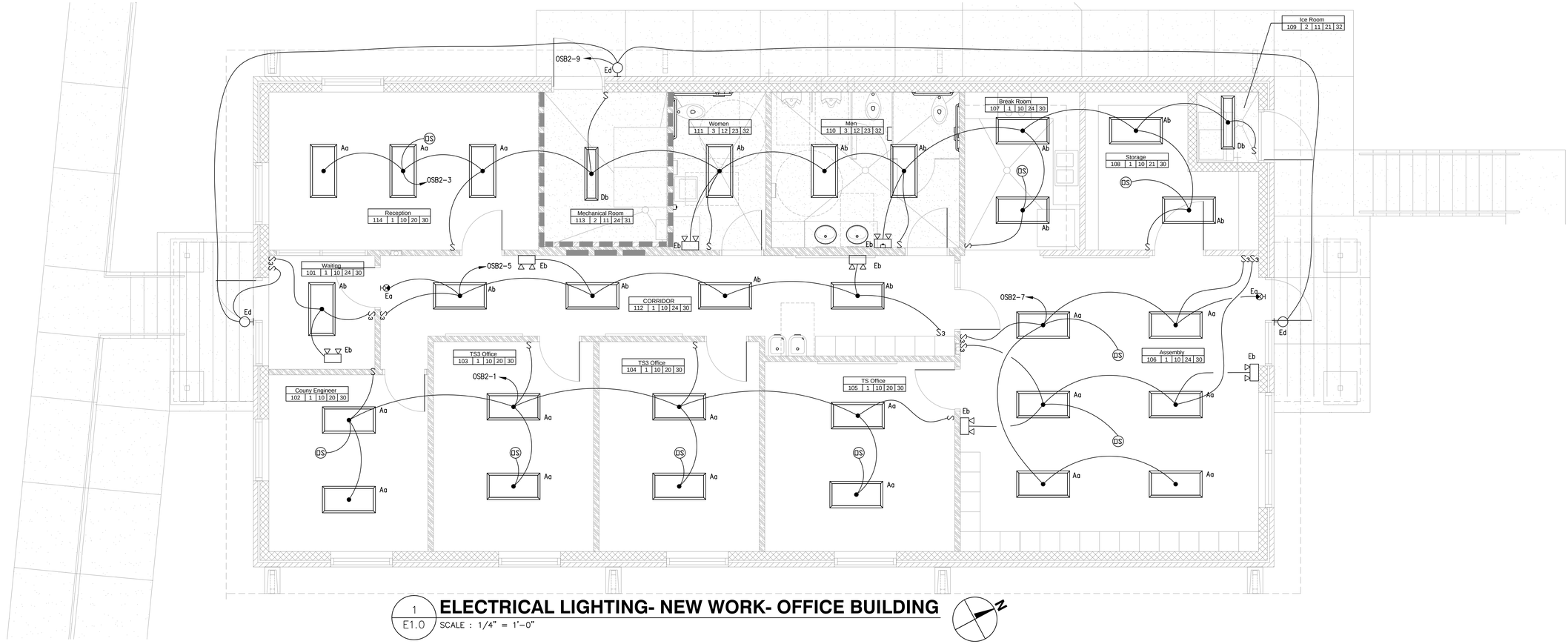
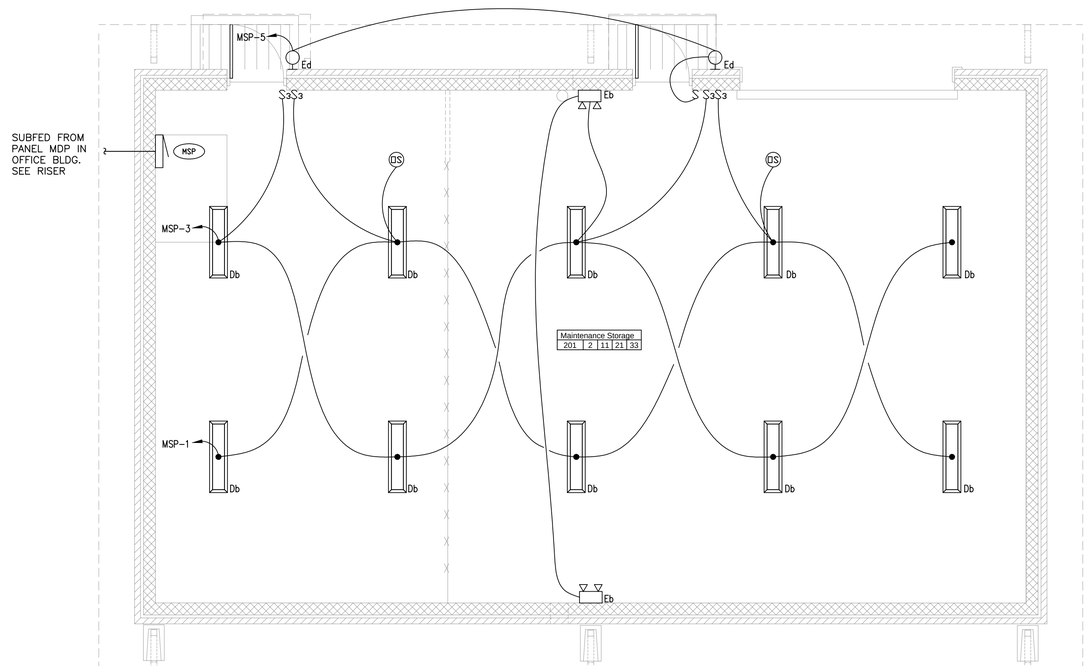


1 E1.0 **ELECTRICAL LIGHTING- NEW WORK- OFFICE BUILDING**

SCALE : 1/4" = 1'-0"



2 E1.0 **ELECTRICAL LIGHTING- NEW WORK- STORAGE BUILDING**

SCALE : 1/4" = 1'-0"

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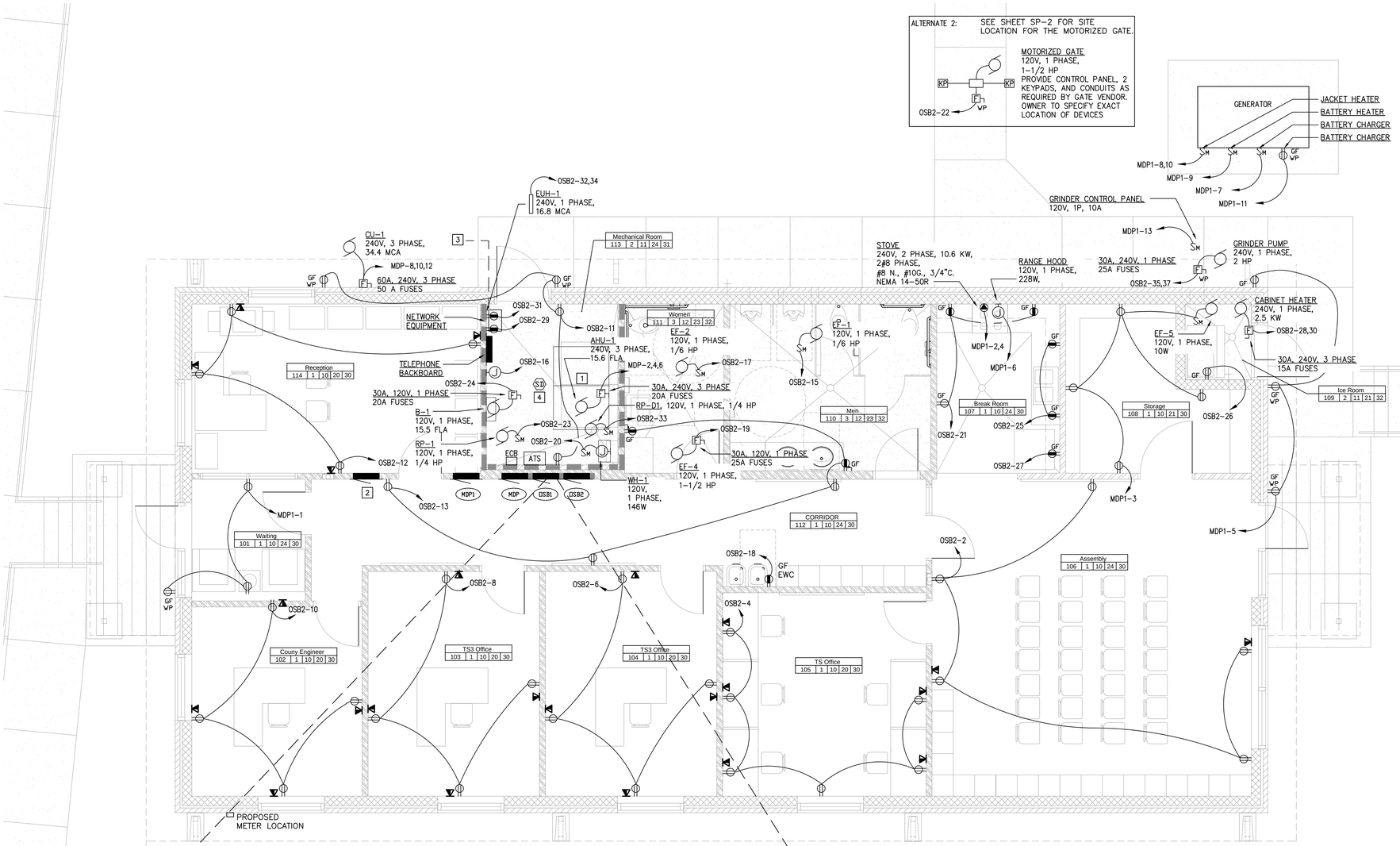


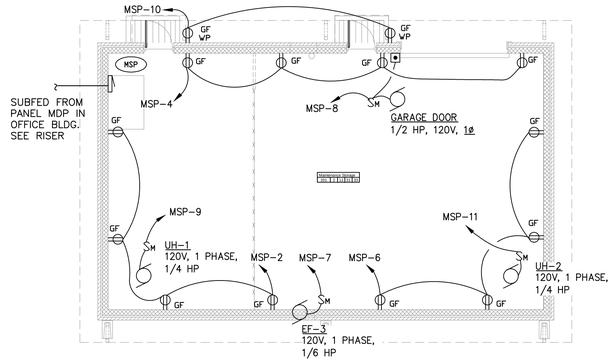
1 E1.1 ELECTRICAL POWER AND DATA- NEW WORK- OFFICE BUILDING

SCALE : 1/4" = 1'-0"

2850 SQ. FT.

NOTES DETAIL 1:

1. PROVIDE SUB-METERING FOR AHU-1 AND CU-1.
2. COORDINATE LOCATION OF GENERATOR ALARM PANEL WITH OWNER PRIOR TO INSTALLATION.
3. LOCATION OF TELECOMMUNICATIONS CABLES TO COME INTO THE FACILITY.
4. CONNECT SMOKE DETECTOR AND MECHANICAL DUCT DETECTOR TO AHU SHUTDOWN CONTROLS. PROVIDE POWER FOR THESE 2 DEVICES VIA CIRCUIT OSB2-14.



2 E1.1 ELECTRICAL POWER- NEW WORK- STORAGE BUILDING

SCALE : 1/8" = 1'-0"

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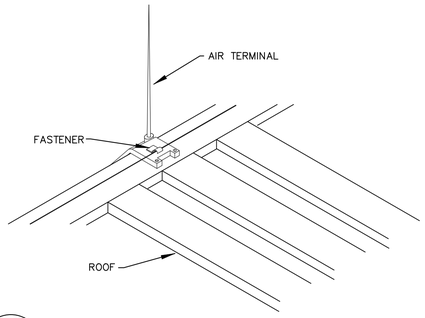
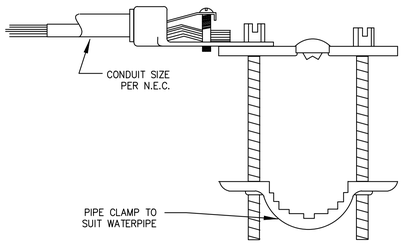
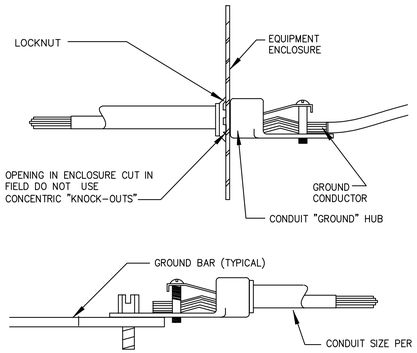
E1.1

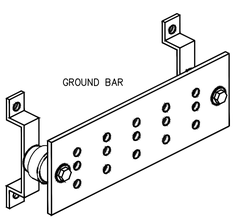


1 / E1.2 ROOF BASE & AIR TERMINAL
NOT TO SCALE

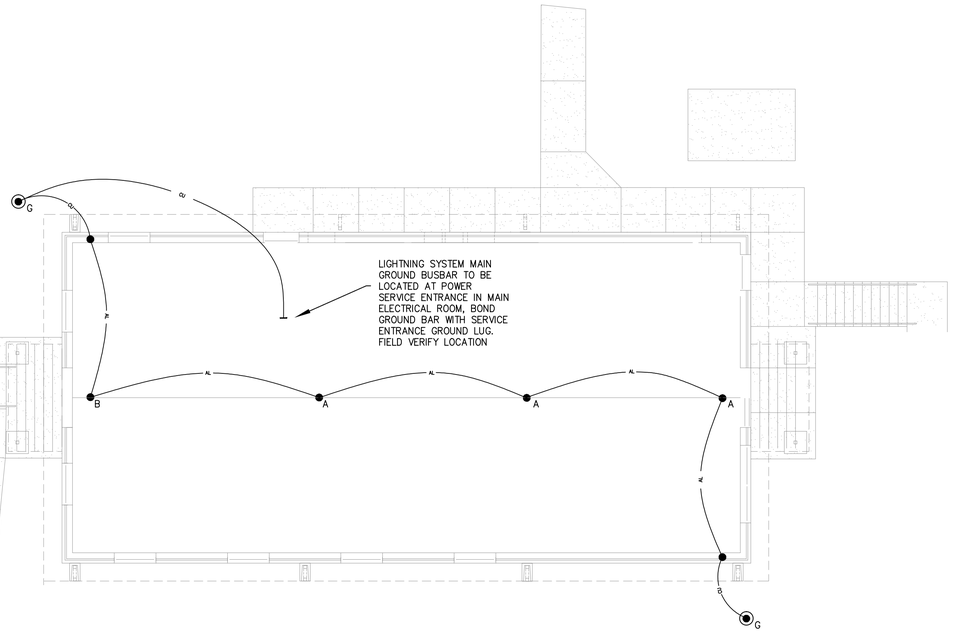




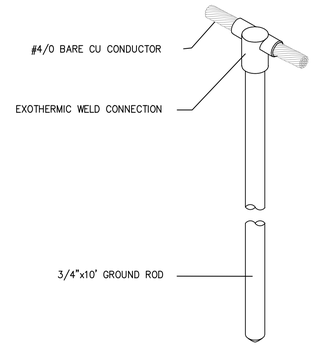
2 / E1.2 GROUNDING CONDUCTOR TERMINATION
NOT TO SCALE



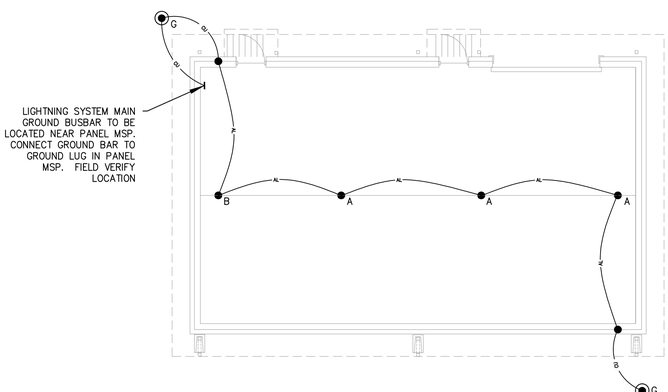
3 / E1.2 GROUND BAR DETAIL
NOT TO SCALE



4 / E1.2 OFFICE BUILDING LIGHTNING PROTECTION PLAN
NOT TO SCALE



6 / E1.2 GROUND ROD DETAIL
NOT TO SCALE



5 / E1.2 STORAGE BUILDING LIGHTNING PROTECTION PLAN
NOT TO SCALE

GENERAL CONSTRUCTION NOTES:

THIS DRAWING IS INTENDED FOR THE USE AS A CONSTRUCTION DOCUMENT. FIELD VERIFY ACTUAL CONDITIONS PRIOR TO CONSTRUCTION. CONTACT VFC. TO CLARIFY ANY DISCREPANCIES.

LEGEND

- AIR TERMINAL
- MECHANICAL CONNECTION
- MISC. BONDING
- THRU-ROOF CONNECTOR
- CLASS 1 ALUMINUM MAIN CONDUCTOR
- CLASS 1 COPPER MAIN CONDUCTOR
- G COPPER CLAD GROUND ROD WITH CADWELD CONNECTION
- GROUND BAR

LIGHTNING PROTECTION NOTES:

1. ACTUAL INSTALLATION SHALL CONFORM TO SHOP DRAWINGS PROVIDED BY A PROPERLY LICENSED AND CERTIFIED LIGHTNING PROTECTION CONTRACTOR, MANUFACTURUER, OR DISTRIBUTOR.
2. ALL AIR TERMINALS, CABLES, GROUND RODS, ETC. SHALL CONFORM TO THE SPECIFICATIONS AND TO NFPA 780.
3. PROVIDE A GROUND RING AROUND THE BUILDING, PLACING GROUND RODS AS REQUIRED BY NFPA 780.
4. ALL DOWN LEADS, GROUND RING CABLES, AND INTERCONNECTING CABLING BETWEEN AIR TERMINALS SHALL BE SHOWN ON THE SHOP DRAWINGS.
5. REFER TO ARCHITECTURAL PLANS FOR BUILDING ELEVATIONS AND SECTIONS FOR ROOF HEIGHTS.
6. ALL UNDERGROUND CONNECTIONS SHALL BE MADE USING EXOTHERMIC WELDS.
7. DOWNLEAD CABLES SHALL BE BROUGHT DIRECTLY THROUGH THE ROOF. THROUGH ROOF CONNECTORS WITH SOLID RODS THROUGH PREFABRICATED PIPE BOOTS SHALL BE UTILIZED FOR THIS PURPOSE. COORDINATE WITH THE ARCHITECT AND GENERAL CONTRACTOR.

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